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GLOBAL DATA MONITORING REPORT

September, 1996

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of AIREP/ASDAR reports received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|
$\geq$ 4 hPa (pressure),
$\geq$ 5 m s^{-1} (wind speed),
$\geq$ 30 degrees (direction).

2.SD
$\geq$ 6 hPa (pressure),
$\geq$ 80 degrees (direction).

3.PGE ≥ 25

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

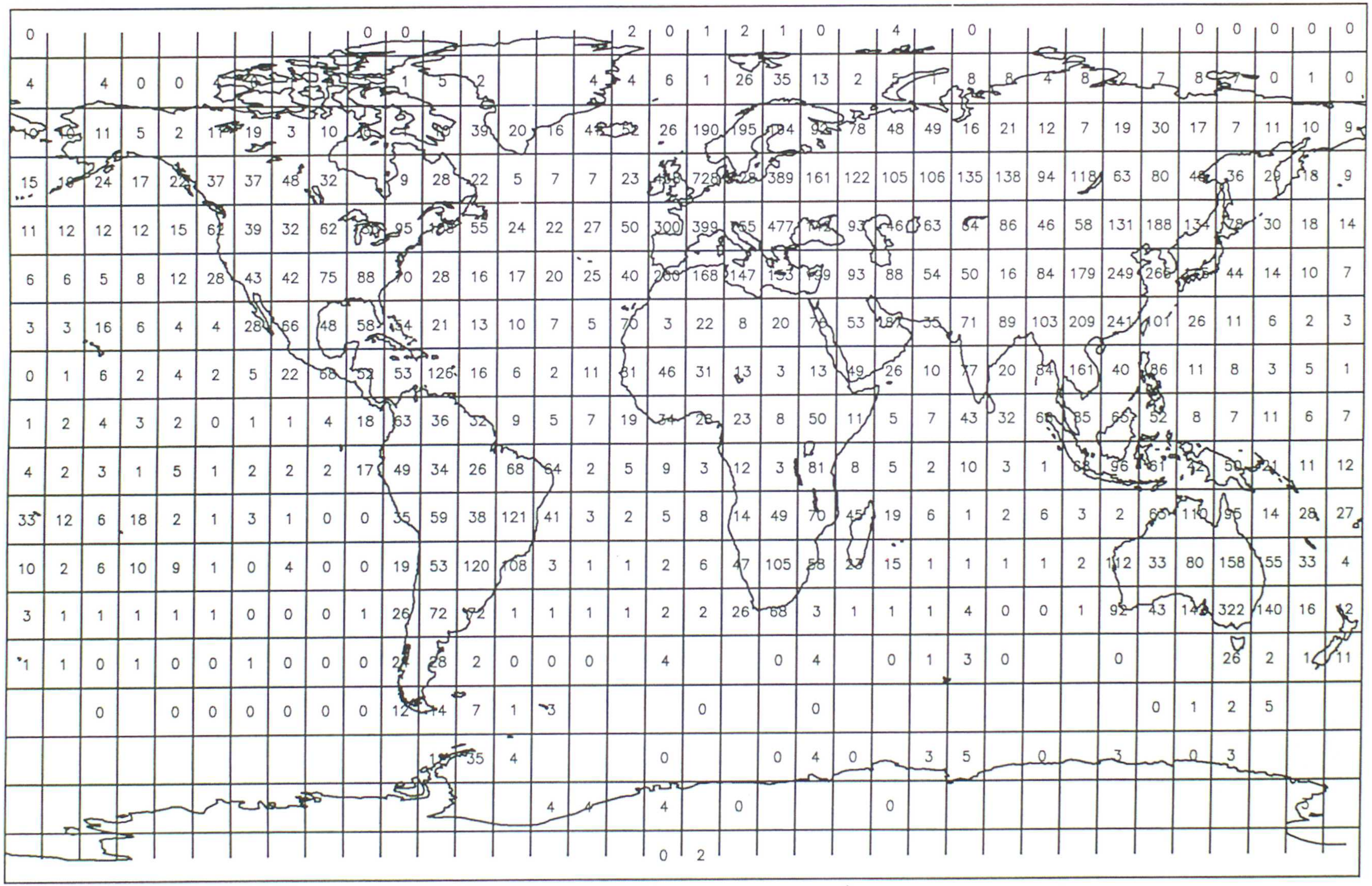
IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
CG2248	ALL	MSLP	SUR	48	48	100	0.0	0.0	0.0
CTFL	ALL	MSLP	SUR	27	0	0	2.4	4.5	5.1
C6HD5	ALL	MSLP	SUR	34	1	3	2.4	4.6	5.2
C6IL3	ALL	MSLP	SUR	24	0	0	0.8	12.3	12.3
C6LI6	ALL	MSLP	SUR	62	0	0	1.1	10.0	10.1
DEGY	ALL	MSLP	SUR	56	0	0	2.1	-4.0	4.5
DZFF	ALL	MSLP	SUR	25	19	76	0.7	-0.6	0.9
ELIG5	ALL	MSLP	SUR	30	0	0	0.7	4.5	4.5
ELIR4	ALL	MSLP	SUR	28	0	0	1.2	5.6	5.7
ELIT9	ALL	MSLP	SUR	23	0	0	1.7	-4.0	4.4
ELRE5	ALL	MSLP	SUR	61	0	0	0.8	6.8	6.8
EUJV	ALL	MSLP	SUR	58	4	7	1.2	9.9	9.9
LAOM4	ALL	MSLP	SUR	44	2	5	4.8	-6.4	8.1
LAWR2	ALL	MSLP	SUR	24	0	0	1.1	5.3	5.4
MVNW9	ALL	MSLP	SUR	35	26	74	0.8	13.8	13.8
NYUK	ALL	MSLP	SUR	29	0	0	1.1	-4.2	4.3
P3XM4	ALL	MSLP	SUR	25	0	0	1.4	-5.9	6.0
SYMK	ALL	MSLP	SUR	42	0	0	1.3	5.7	5.8
S6CL	ALL	MSLP	SUR	26	0	0	1.0	6.0	6.1
UCJJ	ALL	MSLP	SUR	31	0	0	1.4	5.0	5.2
UQYZ	ALL	MSLP	SUR	27	0	0	0.8	4.4	4.5
USNN	ALL	MSLP	SUR	36	0	0	1.2	-4.5	4.6
VCQL	ALL	MSLP	SUR	46	0	0	2.5	-5.0	5.6
VCTV	ALL	MSLP	SUR	29	5	17	4.0	-4.8	6.2
VDRV	ALL	MSLP	SUR	20	19	95	0.0	-4.8	4.8
VOPM	ALL	MSLP	SUR	26	7	27	3.6	-4.6	5.8
VTCN	ALL	MSLP	SUR	40	0	0	2.4	8.7	9.0
V2SA	ALL	MSLP	SUR	35	0	0	2.1	-10.0	10.2
YJYS6	ALL	MSLP	SUR	24	0	0	2.0	7.0	7.3
YLBF	ALL	MSLP	SUR	22	0	0	1.0	6.4	6.5
3ESE9	ALL	MSLP	SUR	39	0	0	1.5	8.4	8.6
3ETG9	ALL	MSLP	SUR	25	21	84	0.4	14.0	14.0
3FGQ3	ALL	MSLP	SUR	30	0	0	1.0	6.7	6.8
3FZW	ALL	MSLP	SUR	23	0	0	1.0	4.8	4.9
48102	ALL	MSLP	SUR	530	163	31	6.8	3.1	7.5
9MBQ6	ALL	MSLP	SUR	31	13	42	3.3	-8.7	9.3
9MBX5	ALL	MSLP	SUR	24	0	0	1.5	5.7	5.9
9MCD	ALL	MSLP	SUR	68	1	1	1.8	9.2	9.3
9VIH	ALL	MSLP	SUR	33	0	0	1.8	-5.6	5.9
WIND SPEED									
DQQQ	ALL	SPEED	SUR	28	0	0	3.0	6.9	7.5
DYZJ	ALL	SPEED	SUR	21	0	0	4.0	8.4	9.3
ELTN5	ALL	SPEED	SUR	23	0	0	6.3	5.7	8.5
FNHW	ALL	SPEED	SUR	36	2	6	7.7	10.6	13.1
FNKA	ALL	SPEED	SUR	23	0	0	6.3	11.3	12.9
FNVA	ALL	SPEED	SUR	65	0	0	2.8	5.0	5.7
GHMA	ALL	SPEED	SUR	77	0	0	2.6	-5.3	5.9
OZIA	ALL	SPEED	SUR	154	1	1	7.6	6.8	10.2
PEBM	ALL	SPEED	SUR	24	0	0	5.6	5.0	7.4
PEOE	ALL	SPEED	SUR	64	0	0	5.2	9.0	10.4
PJOX	ALL	SPEED	SUR	78	0	0	4.2	6.6	7.8
PPXI	ALL	SPEED	SUR	33	0	0	2.8	6.1	6.7
VRUX3	ALL	SPEED	SUR	37	0	0	6.6	11.8	13.6
V7AM4	ALL	SPEED	SUR	36	0	0	2.3	5.3	5.8
52007	ALL	SPEED	SUR	20	0	0	2.0	-5.9	6.2
9VXB	ALL	SPEED	SUR	21	0	0	3.1	5.1	6.0

```
IDENTIFIER    HOUR   ELEM    LEVEL   NOBS   NGE   PGE    SD       BIAS     RMS

WIND DIRECTION

C6FA3         ALL    DIRN.   SUR      26     0     0   40.3     -33.7     52.5
C6LF9         ALL    DIRN.   SUR      32     0     0   45.1     -33.1     55.9
HZLL          ALL    DIRN.   SUR      21     0     0   91.3       1.3     91.4
LAOM4         ALL    DIRN.   SUR      26     0     0  109.5     -10.4    110.0
UCAE          ALL    DIRN.   SUR      25     0     0   82.8       3.9     82.8

UCJJ          ALL    DIRN.   SUR      22     0     0   47.0     -38.3     60.6
UPQY          ALL    DIRN.   SUR      37     0     0   45.3     -30.1     54.3
43001         ALL    DIRN.   SUR      55     0     0   55.0      32.7     64.0
46006         ALL    DIRN.   SUR      33     0     0   63.7      33.8     72.1
46027         ALL    DIRN.   SUR      43     0     0   29.6     -41.4     50.9

46045         ALL    DIRN.   SUR      26     0     0   64.8      74.0     98.3
51006         ALL    DIRN.   SUR      57     0     0   64.8      60.1     88.4
51007         ALL    DIRN.   SUR      71     0     0   30.6      39.9     50.3
51301         ALL    DIRN.   SUR      61     0     0   73.6      31.5     80.0
51302         ALL    DIRN.   SUR      97     0     0   30.2     -37.5     48.2

52315         ALL    DIRN.   SUR      44     0     0   38.5      41.2     56.4
52318         ALL    DIRN.   SUR      23     0     0  105.4     -35.8    111.3
62126         ALL    DIRN.   SUR      57     1     2  109.9     -30.2    114.0
```

AVAILABILITY – SHIP/SYNOP – SEPTEMBER 1996

FIGURE 1

MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 19804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4 4 0 0 4 1 5 2 4 4 6 1 26 35 13 2 5 1 8 8 4 8 2 7 8 7 0 1 0
10 10 11 5 2 17 19 3 10 6 1 10 39 20 16 41 52 26 190 195 134 92 78 48 49 16 21 12 7 19 30 17 7 11 10 9
15 16 24 17 22 37 37 48 32 9 28 22 5 7 7 23 438 728 328 389 161 122 105 106 135 138 94 118 63 80 48 36 29 18 9
11 12 12 12 15 62 39 32 62 180 95 168 55 24 22 27 50 300 399 155 477 142 93 46 63 64 86 46 58 131 188 134 78 30 18 14
6 6 5 8 12 28 43 42 75 88 70 28 16 17 20 25 40 260 168 147 153 139 93 88 54 50 16 84 179 249 266 135 44 14 10 7
3 3 16 6 4 4 28 66 48 58 134 21 13 10 7 5 70 3 22 8 20 76 53 187 35 71 89 103 209 241 101 26 11 6 2 3
0 1 6 2 4 2 5 22 68 52 53 126 16 6 2 11 81 46 31 13 3 13 49 26 10 77 20 84 161 40 86 11 8 3 5 1
1 2 4 3 2 0 1 1 4 18 63 36 32 9 5 7 19 34 28 23 8 50 11 5 7 43 32 68 85 65 52 8 7 11 6 7
4 2 3 1 5 1 2 2 2 17 49 34 26 68 64 2 5 9 3 12 3 81 8 5 2 10 3 1 68 96 61 42 50 21 11 12
33 12 6 18 2 1 3 1 0 0 35 59 38 121 41 3 2 5 8 14 49 70 45 19 6 1 2 6 3 2 65 110 95 14 28 27
10 2 6 10 9 1 0 4 0 0 19 53 120 108 3 1 1 2 6 47 105 58 23 15 1 1 1 1 2 112 33 80 158 155 33 4
3 1 1 1 1 1 0 0 0 1 26 72 72 1 1 1 1 2 2 26 68 3 1 1 1 4 0 0 1 92 43 143 322 140 16 12
1 1 0 1 0 0 1 0 0 0 27 28 2 0 0 0 4 0 4 0 1 3 0 0 26 2 1 11
0 0 0 0 0 0 0 12 14 7 1 3 0 0 0 1 2 5
1 35 4 0 0 4 0 3 5 0 3 0 3
4 4 4 0 0
0 2

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Figures 25-27 show satellite mean observation-background temperature differences for NOAA-12 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area
10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 has been replaced by statistics for GOES-8 and GOES-9.

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

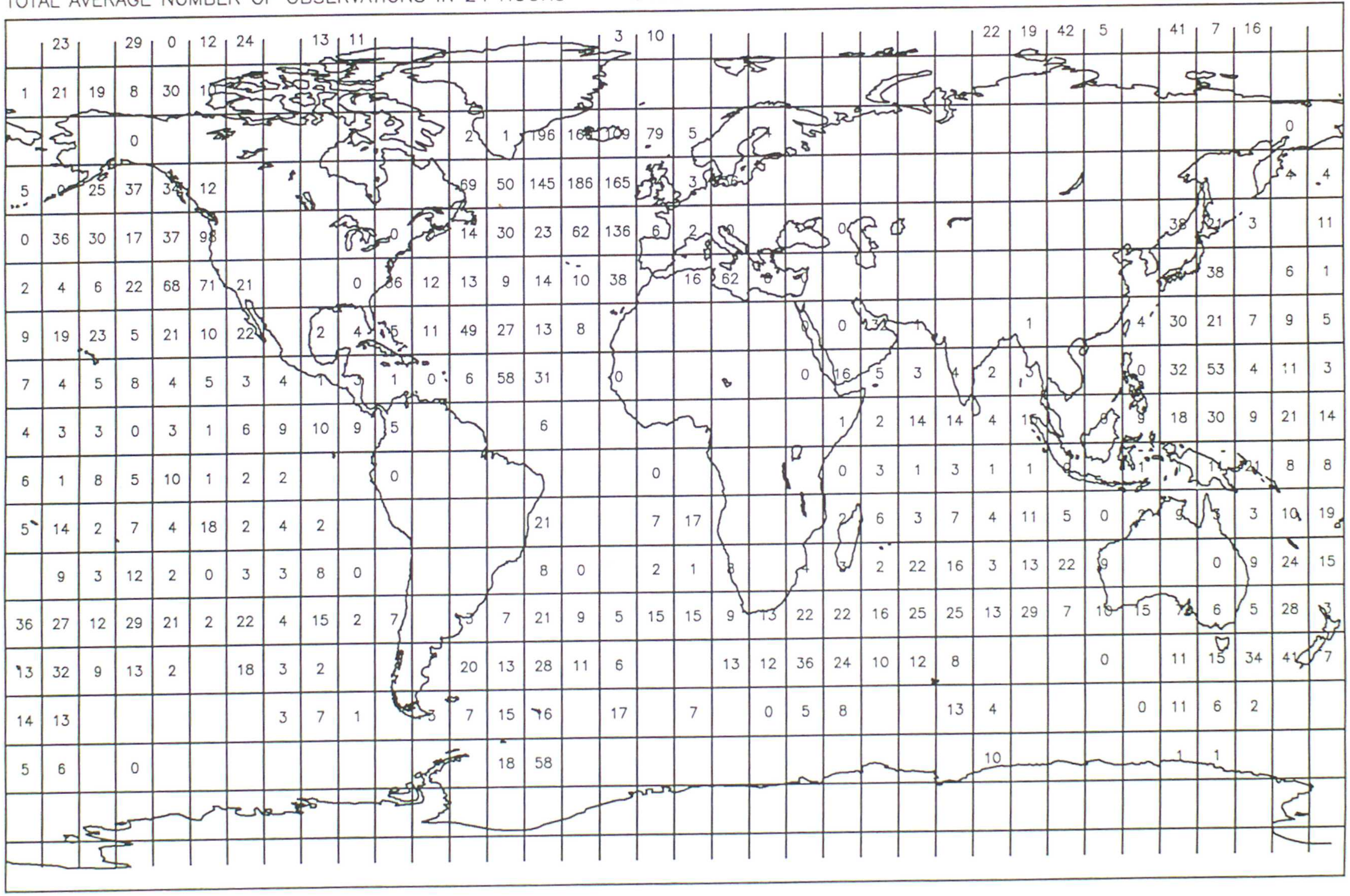
Monitoring procedures			
Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from Bracknell global model.	
Position		:Average latitude and longitude for period.	
Observation times		:00, 06, 12, 18 UTC	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees).	
Parameters monitored			
	:NOBS	:Number of observations received excluding duplicates.	
	:NGE	:Number of observations with gross errors.	
	:PGE	:Percentage of observations with gross errors.	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa	(pressure)	
	:25 m s^{-1}	(vector wind)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.¦bias¦	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
16941	-39.0	49.0	ALL	MSLP	SUR	232	48	21	7.0	-1.2	7.1
25547	86.4	-5.6	ALL	MSLP	SUR	369	0	0	2.1	-4.0	4.6
33521	-39.7	-52.0	ALL	MSLP	SUR	219	2	1	5.3	4.8	7.1
33561	-38.7	-3.3	ALL	MSLP	SUR	76	1	1	3.3	4.3	5.4
33909	-38.5	-29.5	ALL	MSLP	SUR	235	0	0	6.1	-1.2	6.2
46609	35.4	-124.3	ALL	MSLP	SUR	25	25	100	0.0	0.0	0.0
46612	38.3	-135.1	ALL	MSLP	SUR	27	0	0	3.6	5.5	6.6
46614	39.1	-126.4	ALL	MSLP	SUR	31	31	100	0.0	0.0	0.0
46615	41.6	-127.9	ALL	MSLP	SUR	28	28	100	0.0	0.0	0.0
48525	70.9	-127.5	ALL	MSLP	SUR	200	70	35	3.7	-6.8	7.7
53825	-10.1	120.8	ALL	MSLP	SUR	53	53	100	0.0	0.0	0.0
54902	-36.9	-143.7	ALL	MSLP	SUR	129	75	58	6.0	-5.0	7.8
54912	-32.5	-137.5	ALL	MSLP	SUR	132	18	14	6.2	-0.7	6.3
54914	-33.6	-148.2	ALL	MSLP	SUR	132	11	8	8.2	-4.5	9.3
54921	-36.6	-135.1	ALL	MSLP	SUR	27	5	19	8.2	-0.5	8.3
54929	-40.0	-116.9	ALL	MSLP	SUR	205	22	11	4.2	-5.3	6.7
55908	-35.5	-174.8	ALL	MSLP	SUR	47	0	0	3.2	-7.0	7.7
WIND SPEED											
44513	56.2	-54.3	ALL	SPEED	SUR	290	0	0	2.7	-5.7	6.3
46551	34.1	-130.2	ALL	SPEED	SUR	58	0	0	1.6	-5.3	5.5
46701	49.2	-168.6	ALL	SPEED	SUR	267	0	0	2.2	-5.1	5.6
91722	18.1	145.8	ALL	SPEED	SUR	27	0	0	1.8	-6.0	6.2
91911	8.3	137.5	ALL	SPEED	SUR	109	0	0	2.2	-5.4	5.8
WIND DIRTECTION											
44613	37.4	-13.8	ALL	DIRN.	SUR	127	1	1	64.3	-48.0	80.2
91911	8.3	137.5	ALL	DIRN.	SUR	57	0	0	51.5	87.4	101.4

FIGURE 2

AVAILABILITY – DRIBU – SEPTEMBER 1996
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 5196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13 32 9 13 2 18 3 2 20 13 28 11 6 13 12 36 24 10 12 8 0 11 15 34 41 7
14 13 3 7 1 3 7 15 16 17 7 0 5 8 13 4 0 11 6 2
5 6 0 18 58 10 1 1

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for synops & autosynops.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).

Parameters monitored :HT(m) :Station height (in metres) as given in WMO No. 9 Vol A

:RP :Pressure reporting practice
M=mean sea level pressure (hPa) reported.
S=Station level pressure reported.
8=Geopotential height (m) of 850 hPa surface reported.
7=Geopotential height (m) of 700 hPa surface reported.

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:%REJ :Percentage of observations flagged.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)

SELECTION CRITERIA :NOBS ≥ 20 ,and one or more of the following:

1.¦bias¦ ≥ 4 hPa
2. SD ≥ 6 hPa
3.PGE ≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	98	3	3	73	1.2	4.7	4.9
60468	35.6N	6.2E	1052	S8	103	102	99	0	0.0	-1.5	1.5
60511	35.3N	1.4E	1127	S8	105	105	100	0	0.0	0.0	0.0
60535	34.7N	3.3E	1144	S8	74	2	3	92	1.0	-5.6	5.7
60571	31.6N	2.2W	773	S8	104	0	0	20	1.0	-4.1	4.2
60670	24.6N	9.5E	1054	S8	107	1	1	98	1.2	8.0	8.1
61233	15.2N	7.3W	265	M	33	0	0	0	0.9	-4.4	4.5
63330	13.5N	39.5E	2212	MS	49	0	0	39	1.3	-5.0	5.2
63333	11.1N	39.7E	1916	MS	65	4	6	94	0.8	6.9	6.9
63451	8.7N	39.0E	1876	MS	56	0	0	4	1.0	-4.3	4.4
63453	8.8N	39.8E	1062	S	50	1	2	0	1.2	11.8	11.9
63478	5.1N	44.6E	320	MS	49	0	0	0	1.1	5.3	5.4
68014	19.6S	18.1E	1411	S8	86	0	0	37	1.2	-5.1	5.2
68038	20.5S	26.0E	903	8	66	0	0	14	1.6	4.0	4.3
68442	29.1S	26.3E	1354	S8	115	0	0	96	1.2	-5.4	5.5
68488	28.4S	31.1E	1279	S8	81	81	100	0	0.0	0.0	0.0
68752	32.8S	27.4E	524	S8	75	0	0	100	1.5	-8.4	8.5

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30554	54.5N	113.6E	995	M	47	1	2	98	1.2	9.9	10.0
31421	52.7N	137.5E	60	M	28	0	0	96	2.0	-6.4	6.7
35173	51.6N	69.8E	620	MS	50	50	100	0	0.0	0.0	0.0
40701	39.3N	44.4E	1470	MS	92	0	0	100	1.0	6.7	6.8
40740	36.8N	54.3E	1287	MS	44	0	0	11	1.9	-4.0	4.4
40743	36.2N	57.7E	941	MS	111	0	0	20	1.4	-5.0	5.2
40762	35.3N	59.2E	1333	M	112	7	6	98	1.4	-13.1	13.2
40763	35.2N	58.5E	1060	MS	46	0	0	22	1.0	-5.5	5.6
40783	32.4N	49.7E	1972	MS	92	0	0	25	1.1	-4.9	5.0
40789	33.8N	55.1E	921	MS	84	1	1	98	2.0	7.7	8.0
40798	32.3N	50.9E	1991	MS	84	0	0	93	1.1	-7.0	7.1
40836	30.8N	51.7E	1880	MS	87	3	3	97	1.1	8.6	8.7
40859	29.0N	53.7E	1383	MS	92	4	4	97	0.9	8.9	8.9
41254	23.1N	57.7E	1755	S8	72	72	100	0	0.0	0.0	0.0
41466	13.7N	44.1E	1385	8	30	1	3	73	0.7	-6.0	6.0
44416	28.6N	81.6E	720	MS	81	1	1	40	1.4	4.5	4.7
44477	27.0N	87.4E	1445	S8	70	70	100	0	0.0	0.0	0.0
47022	40.8N	128.2E	1206	S	102	0	0	22	1.5	4.1	4.4
52602	38.8N	93.4E	2734	S	120	0	0	2	1.3	-4.2	4.4
56018	32.9N	95.3E	4068	S	118	0	0	0	1.4	4.0	4.2
56444	28.5N	98.9E	3488	S	116	116	100	0	0.0	0.0	0.0
56462	29.0N	101.5E	2994	S	115	0	0	97	2.0	7.7	8.0

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	M	44	1	2	0	1.1	-5.3	5.4
82326	3.8S	62.1W	49	MS	72	0	0	8	2.0	4.2	4.7
82704	7.6S	72.7W	170	MS	80	0	0	0	1.6	-4.1	4.4
83214	10.3S	54.9W	285	M	48	0	0	2	2.1	-6.0	6.4
83235	12.4S	46.4W	660	MS	71	0	0	99	1.0	6.7	6.8
83295	13.4S	39.9W	755	MS	51	0	0	92	0.7	-4.2	4.3
83332	14.1S	46.4W	950	MS	73	28	38	0	0.9	13.8	13.8
83361	15.6S	56.1W	179	MS	77	0	0	3	1.9	4.6	5.0
83408	14.3S	43.8W	556	MS	75	0	0	100	1.2	10.5	10.6
83423	16.7S	49.3W	729	MS	76	0	0	88	1.2	-4.9	5.0
83488	17.8S	42.9W	1097	MS	74	74	100	0	0.0	0.0	0.0
83512	18.5S	54.8W	286	MS	39	0	0	28	3.4	-5.5	6.5

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
83531	18.6S	46.5W	896	MS	61	1	2	59	1.7	-6.2	6.4
83587	19.9S	43.9W	850	MS	78	1	1	92	2.3	-7.7	8.0
83689	21.3S	43.8W	1171	MS	56	0	0	77	1.0	4.7	4.8
83704	22.3S	53.9W	369	MS	68	6	9	10	3.2	-9.2	9.7
83773	23.1S	48.9W	793	MS	30	0	0	80	1.0	-5.9	6.0
83781	23.5S	46.6W	792	MS	88	1	1	81	1.5	4.6	4.8
83836	25.5S	50.6W	837	MS	81	0	0	62	1.4	-4.9	5.1
83916	28.2S	51.5W	806	MS	73	0	0	86	1.1	-5.2	5.3
84401	5.2S	80.6W	55	MS	117	0	0	6	1.4	5.4	5.6
84455	6.5S	76.4W	282	MS	84	1	1	1	1.8	6.8	7.0
84472	7.1S	78.5W	2622	S	55	1	2	84	1.1	-5.3	5.4
84501	8.1S	79.0W	30	MS	116	0	0	4	1.1	6.2	6.3
84542	9.4S	77.6W	2760	S	49	1	2	2	2.6	5.2	5.8
84686	13.6S	72.0W	3249	S	119	0	0	7	1.9	-6.0	6.3
84782	18.1S	70.3W	469	MS	117	0	0	1	1.7	9.8	9.9
85264	18.5S	64.1W	1998	S	47	3	6	0	1.8	-11.2	11.3
85394	22.8S	64.3W	381	MS	38	0	0	3	2.2	4.3	4.8
85406	18.3S	70.3W	58	M	119	0	0	3	1.3	8.2	8.3
85418	20.5S	70.2W	48	M	113	0	0	0	1.4	5.6	5.8
85442	23.4S	70.4W	135	M	115	0	0	1	1.3	4.6	4.8

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71094	66.7N	61.4W	722	MS	120	0	0	38	1.5	-5.3	5.5
76118	30.4N	109.7W	1040	MS	34	0	0	100	1.0	-10.3	10.3
76539	22.1N	101.0W	1870	MS	92	1	1	85	0.8	-4.4	4.5
76551	21.7N	106.5W	5	MS	38	0	0	97	2.2	-9.2	9.5
76625	20.6N	100.4W	1813	MS	24	0	0	96	0.8	-7.2	7.2
76632	20.1N	98.7W	2417	MS	46	0	0	91	0.8	-5.6	5.7
76634	20.1N	98.4W	2135	MS	82	1	1	77	0.7	-4.9	4.9
76658	19.2N	103.7W	494	MS	38	0	0	0	1.3	5.1	5.3
76762	17.5N	99.5W	1865	MS	100	100	100	0	0.0	0.0	0.0
76773	17.8N	97.8W	1680	MS	29	0	0	100	1.0	7.3	7.4

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
91339	5.5N	153.8E	3	MS	36	0	0	0	0.7	-5.6	5.6

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01245	62.6N	9.7E	630	MS	88	0	0	97	0.9	-5.2	5.3
02045	67.8N	20.4E	408	M	108	108	100	0	0.0	0.0	0.0
08221	40.5N	3.6W	633	MS	118	0	0	97	0.9	6.2	6.3
11024	48.4N	15.4E	860	S8	114	1	1	100	0.7	-13.3	13.3
11346	47.3N	12.8E	917	S8	87	0	0	16	1.1	-4.0	4.1
16020	46.5N	11.3E	1461	MS	88	88	100	0	0.0	0.0	0.0
16227	41.9N	13.6E	655	MS	95	86	91	0	0.6	-14.2	14.2
16549	39.1N	8.3E	12	MS	90	0	0	0	0.9	-4.2	4.3
16614	40.4N	21.3E	604	MS	115	0	0	100	1.0	-7.6	7.7
40072	34.4N	40.9E	182	M	90	0	0	1	1.3	-4.2	4.4

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89066	68.1S	67.1W	4	MS	118	0	0	3	3.1	-4.0	5.1
89664	77.9S	166.7E	24	MS	93	0	0	0	2.3	-4.8	5.3
89744	74.0S	43.0E	3353	S	75	0	0	12	2.5	5.5	6.0
89774	73.4S	76.8E	2565	S	90	0	0	0	2.5	4.3	5.0
89860	74.2S	160.3E	1772	S	71	1	1	23	3.0	-8.8	9.3

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

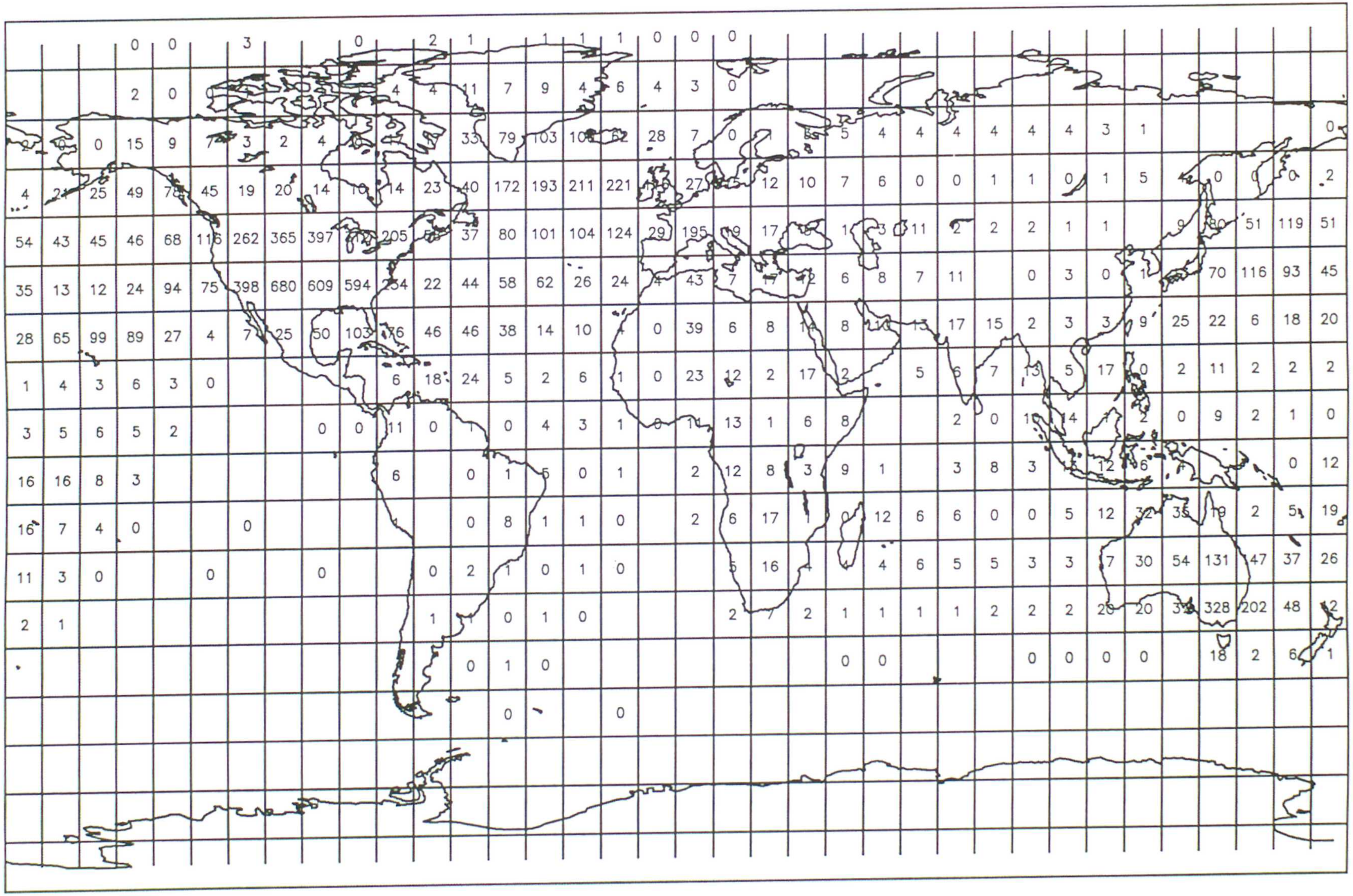
	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	169	2	3	2.0	0.6	170	0	2	0	9.4	2.5
AAL	5522	0	1	1.8	0.1	5501	0	2	0	8.6	0.8
AAN	315	0	3	1.8	-0.4	313	0	5	1	10.7	0.7
AAR	1903	1	1	1.7	0.0	1909	0	3	0	8.6	0.9
ACA	1773	1	1	2.1	0.4	1820	0	2	0	7.4	0.4
ACI	40	0	3	1.2	0.5	40	0	3	0	9.8	1.1
AEA	605	1	100	3.3	2.2	578	0	4	0	9.2	0.5
AEL	775	1	4	2.2	0.3	782	0	3	0	8.0	0.4
AFL	335	3	100	3.5	1.8	332	0	7	2	9.6	-0.2
AFR	1451	1	4	1.8	0.0	1470	0	5	0	8.3	1.1
AIC	37	0	5	2.6	-0.1	37	0	8	0	12.2	0.9
AIH	222	0	1	1.9	0.0	223	0	3	0	9.5	0.7
AJM	21	0	0	1.3	0.2	24	0	0	0	7.3	-0.1
AMT	390	0	2	1.7	0.7	387	0	3	0	6.6	0.2
AMX	259	5	5	1.8	-0.1	266	0	5	0	8.2	0.5
ANA	867	0	1	1.7	-0.3	864	0	3	0	8.8	0.5
ANZ	2518	2	3	1.9	-0.3	2490	0	2	0	8.2	0.8
AOM	565	1	2	1.6	1.1	576	0	2	0	7.6	0.8
ARP	116	0	4	2.0	1.2	102	0	3	3	5.7	0.7
ASY	21	0	0	1.3	0.9	21	0	0	0	7.5	1.5
ATN	30	0	7	1.8	-0.7	30	0	100	0	12.7	1.0
AUA	108	1	5	1.8	-0.6	110	0	6	0	8.0	0.7
AVA	368	1	2	1.7	0.1	372	0	4	1	10.2	0.9
AVN	31	0	0	1.3	0.4	31	3	3	0	7.3	-0.7
AZA	580	1	6	2.7	1.0	586	0	4	0	8.9	1.4
BAL	619	1	12	1.5	-0.2	641	0	14	0	9.0	0.8
BAW	1610	0	2	2.0	0.1	1632	0	4	0	8.8	1.0
BBB	31	0	3	1.4	-0.4	33	0	3	0	6.6	0.5
BWA	420	0	2	2.7	1.9	423	0	3	0	8.2	1.1
CAL	1915	1	2	1.8	0.0	1919	0	2	0	8.3	0.8
CCA	144	0	0	2.0	0.4	171	0	6	0	11.5	-0.5
CDN	2713	0	1	2.1	0.5	2715	0	3	0	8.4	0.5
CES	236	0	1	1.6	0.5	240	1	4	0	10.4	0.0
CFC	39	0	10	2.3	-0.5	40	0	13	0	7.5	1.3
CFG	980	0	1	1.8	-0.8	982	0	2	0	8.1	0.6
CHG	35	0	3	2.2	0.7	37	0	5	0	8.8	2.4
CKS	143	3	99	2.5	-0.6	147	0	5	1	9.1	0.2
CKT	148	0	4	1.6	0.7	147	1	7	0	8.2	0.1
CLI	257	0	1	2.3	0.5	261	0	2	0	8.5	0.6
CLX	289	0	2	2.1	-0.4	289	0	2	0	8.8	0.4
CMI	751	1	2	1.8	0.5	759	0	4	2	7.8	1.2
CMM	441	0	2	2.0	0.2	443	0	1	0	7.3	0.9
COA	859	0	1	1.7	0.6	863	0	2	0	8.0	0.8
CPA	94	0	4	2.0	-0.4	99	0	3	0	9.3	1.5
CRL	500	1	3	1.7	0.6	503	0	3	1	8.1	1.4
CSA	22	0	0	1.7	-0.8	22	0	0	0	7.9	0.7
CTM	50	4	14	1.7	0.2	50	0	14	0	9.8	1.0
CUB	388	1	100	2.8	1.9	390	0	11	1	9.8	1.4
DAF	27	0	0	2.5	0.0	27	0	0	0	7.0	1.0
DAL	5437	0	2	2.2	0.8	4971	0	2	0	8.4	0.5
DHL	325	6	100	5.1	-2.8	330	0	7	0	12.2	1.2
DLH	3697	1	7	2.0	0.3	3692	0	10	2	8.8	1.1
DOA	94	0	2	1.7	-0.2	92	0	4	1	9.3	0.9
EIA	90	2	6	1.7	-0.4	92	0	3	0	8.4	0.8
ELY	96	1	6	1.8	0.0	101	0	13	0	10.6	1.1
EVA	1099	0	1	1.8	-0.1	1144	0	3	0	9.6	0.4
EWW	141	0	100	4.0	0.9	143	0	100	0	14.7	4.5
FDX	1374	0	1	1.8	0.7	1387	0	2	0	8.4	0.6
FIN	420	0	2	1.9	0.6	418	1	4	0	8.4	0.9

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FJI	457	3	5	1.7	0.7	452	0	3	1	7.8	0.4
FNY	28	0	0	2.0	0.3	28	0	0	0	9.4	0.0
FOM	101	3	3	2.4	0.8	113	0	73	0	12.7	1.3
GAF	169	1	1	2.1	0.3	170	0	0	0	7.8	1.1
GFA	32	0	0	1.5	0.1	32	0	0	0	5.9	-0.4
GHA	23	0	0	2.3	1.2	23	0	4	0	9.8	1.6
GIA	180	1	1	1.5	0.3	183	0	3	0	7.8	1.7
HAL	1567	0	0	1.3	0.4	1570	0	2	1	8.0	0.8
HLF	191	1	2	1.3	-0.7	189	0	3	0	8.4	0.3
HRH	50	2	10	1.8	0.7	49	0	10	0	8.9	1.1
IBE	3632	1	18	1.9	0.6	3621	0	20	0	9.1	0.9
ICE	681	1	2	1.9	0.2	678	0	2	0	8.0	1.1
JAL	6697	0	1	1.8	0.4	6724	0	2	0	8.6	1.0
JAZ	66	0	0	2.1	1.1	66	0	0	0	7.4	1.8
KAL	3632	1	1	1.8	-0.1	3633	0	2	0	9.0	0.7
KIC	64	0	2	1.9	0.7	68	0	4	0	12.3	-0.2
KIW	30	0	7	4.0	3.5	30	0	0	0	11.3	0.8
KLM	2223	0	1	1.8	0.4	2217	0	2	1	7.3	0.7
LDA	314	0	6	1.8	-0.9	315	0	6	0	8.1	0.4
LDI	159	0	21	1.9	-1.2	159	0	21	0	8.2	0.6
LIB	295	1	3	1.5	0.6	295	0	4	1	7.6	0.6
LKR	49	0	2	2.2	1.2	51	0	0	0	8.0	1.6
LOT	298	0	2	2.0	-0.7	296	0	5	0	8.9	0.7
LTU	815	0	4	1.7	0.3	774	0	4	0	8.3	0.7
MAS	290	0	1	1.8	0.0	321	0	3	0	9.0	0.3
MDA	172	0	0	1.7	0.1	173	0	3	1	9.4	0.3
MON	20	5	0	1.3	0.4	20	0	0	0	6.5	1.1
MPH	720	0	1	2.0	-0.1	721	0	2	0	7.7	0.8
NCA	634	0	1	1.8	0.3	632	0	3	1	8.7	0.5
NWA	11207	0	2	2.1	0.8	11235	0	2	1	8.6	0.8
OAL	29	0	7	3.6	3.0	29	0	7	0	10.8	2.5
PAC	150	2	5	1.8	0.2	159	1	4	0	7.4	0.7
PAL	985	1	2	1.5	-0.2	991	0	5	2	9.2	0.8
PAO	171	2	2	1.5	0.1	167	1	3	0	10.4	0.9
PNL	99	2	3	1.9	0.7	98	0	4	0	11.5	0.0
QFA	1072	1	2	1.8	0.1	1074	0	2	1	7.9	0.7
RAF	188	1	1	1.8	0.5	187	0	1	0	9.9	1.7
RCH	487	3	97	2.9	1.0	494	0	97	0	11.3	2.2
RIA	101	2	6	2.6	1.3	101	0	4	0	10.4	2.3
RJA	67	0	1	2.1	0.8	67	1	3	0	7.8	0.2
RKA	112	0	0	1.3	-0.1	112	0	1	0	6.5	0.8
RRR	148	0	12	2.3	0.0	149	0	15	0	9.8	0.4
SAA	296	0	2	1.9	0.2	298	0	4	1	8.8	1.6
SAB	26	0	4	2.1	0.9	27	0	4	0	7.8	0.4
SAS	1197	0	3	2.5	0.5	1190	0	2	0	8.5	0.3
SIA	1366	0	1	1.6	-0.6	1406	0	2	0	8.6	0.8
SLR	77	0	10	1.6	-0.6	83	0	16	0	9.9	2.5
SOL	50	0	0	1.2	0.6	49	0	2	0	8.7	-0.4
SPP	184	2	17	1.2	0.1	178	0	17	0	7.8	1.0
SVA	132	1	4	2.5	0.9	140	0	8	0	10.8	2.2
SVV	27	0	15	3.8	2.2	27	0	15	0	15.8	10.1
SWR	172	1	3	1.8	0.5	173	0	4	0	11.0	3.1
TAP	810	1	5	1.8	0.0	812	0	7	0	9.7	1.3
TEJ	81	0	11	1.4	0.4	81	0	14	0	9.4	1.7
THA	275	0	1	1.7	-0.4	283	0	4	0	9.1	-0.2
TOW	87	1	7	2.2	0.4	88	0	3	0	7.2	1.4
TSC	203	1	6	2.8	0.9	206	0	5	0	10.3	1.6
TWA	1885	0	2	2.0	0.3	1880	0	3	0	8.6	1.3
UAL	13935	0	1	1.8	-0.1	14029	0	2	0	7.8	0.7

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
UKR	25	0	32	4.8	1.0	27	0	30	0	9.3	-1.3
ULE	228	0	1	1.4	0.4	222	0	4	0	9.1	0.4
UPS	918	2	12	1.8	0.0	917	0	12	0	8.6	1.4
USA	269	0	1	1.6	0.0	261	0	4	0	9.1	1.0
VIA	661	0	3	1.7	0.9	656	0	4	1	7.4	0.6
VIR	243	0	1	2.0	0.1	246	0	4	0	9.1	1.8
VRG	94	4	6	2.5	0.6	93	0	4	0	10.3	0.7
VSP	189	1	2	2.1	0.6	189	0	3	0	9.7	1.0
WOA	176	0	3	2.0	0.9	189	1	4	0	8.3	0.8
AN	23622	0	2	1.3	0.2	23471	0	2	0	7.1	0.7
BA	22211	0	7	1.2	0.4	22160	0	7	0	7.0	1.3
DL	95953	0	3	1.1	0.1	95953	0	0	0	6.6	1.3
FJ	55	2	7	1.7	0.6	55	0	5	0	7.7	0.4
IT	189	0	10	1.1	0.0	188	0	1	0	6.0	1.2
KL	12401	0	7	1.1	0.3	12391	0	6	0	6.4	1.1
LH	3570	0	2	1.4	0.4	3547	0	3	1	6.7	1.0
MK	4702	0	1	1.3	0.8	4675	0	2	0	9.4	1.2
NW	31365	0	2	1.3	0.2	31365	0	2	0	6.2	1.2
QF	8347	1	1	1.3	0.4	8338	0	1	0	6.9	0.9
SA	2750	11	11	1.2	0.7	2748	0	9	0	13.8	3.1
SV	265	0	0	1.1	0.8	263	0	0	0	5.6	-1.0
N	441	1	4	2.4	0.3	455	0	4	0	9.5	1.1

MEAN DAILY COUNT OF AIRCRAFT 70 – 500 HPA
SEPTEMBER 1996
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

FIGURE 3



AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

FIGURE 4

SEPTEMBER 1996

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

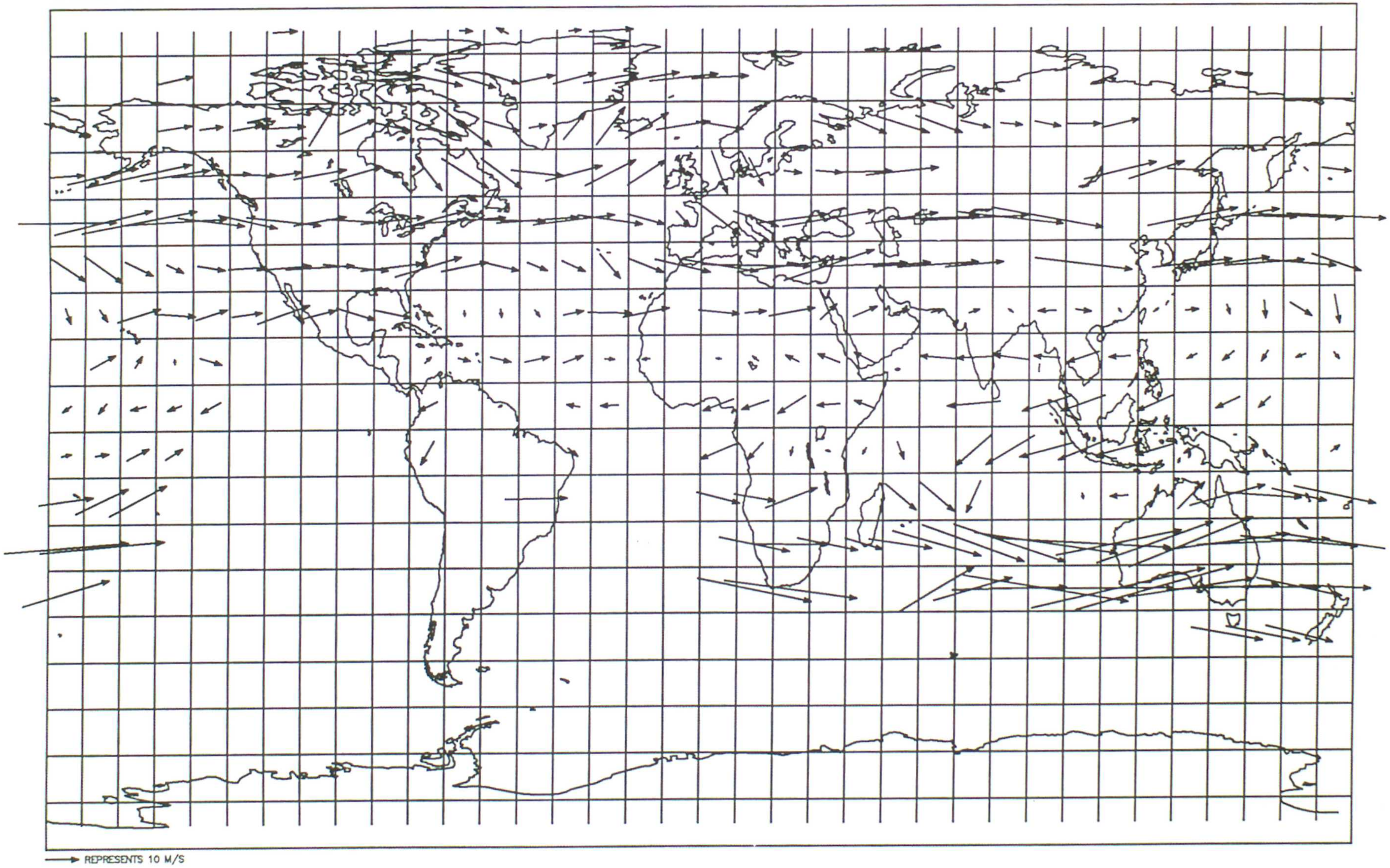
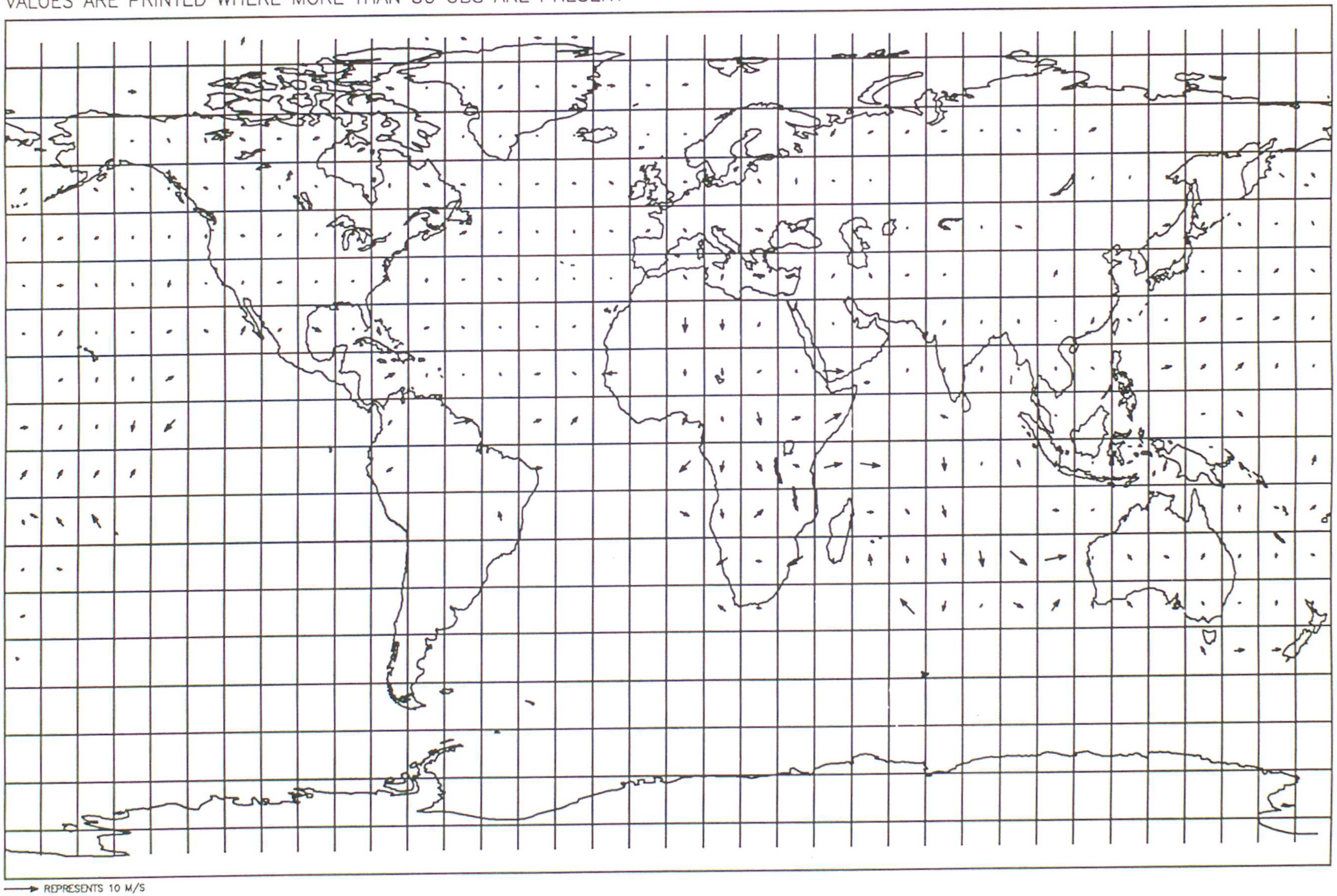
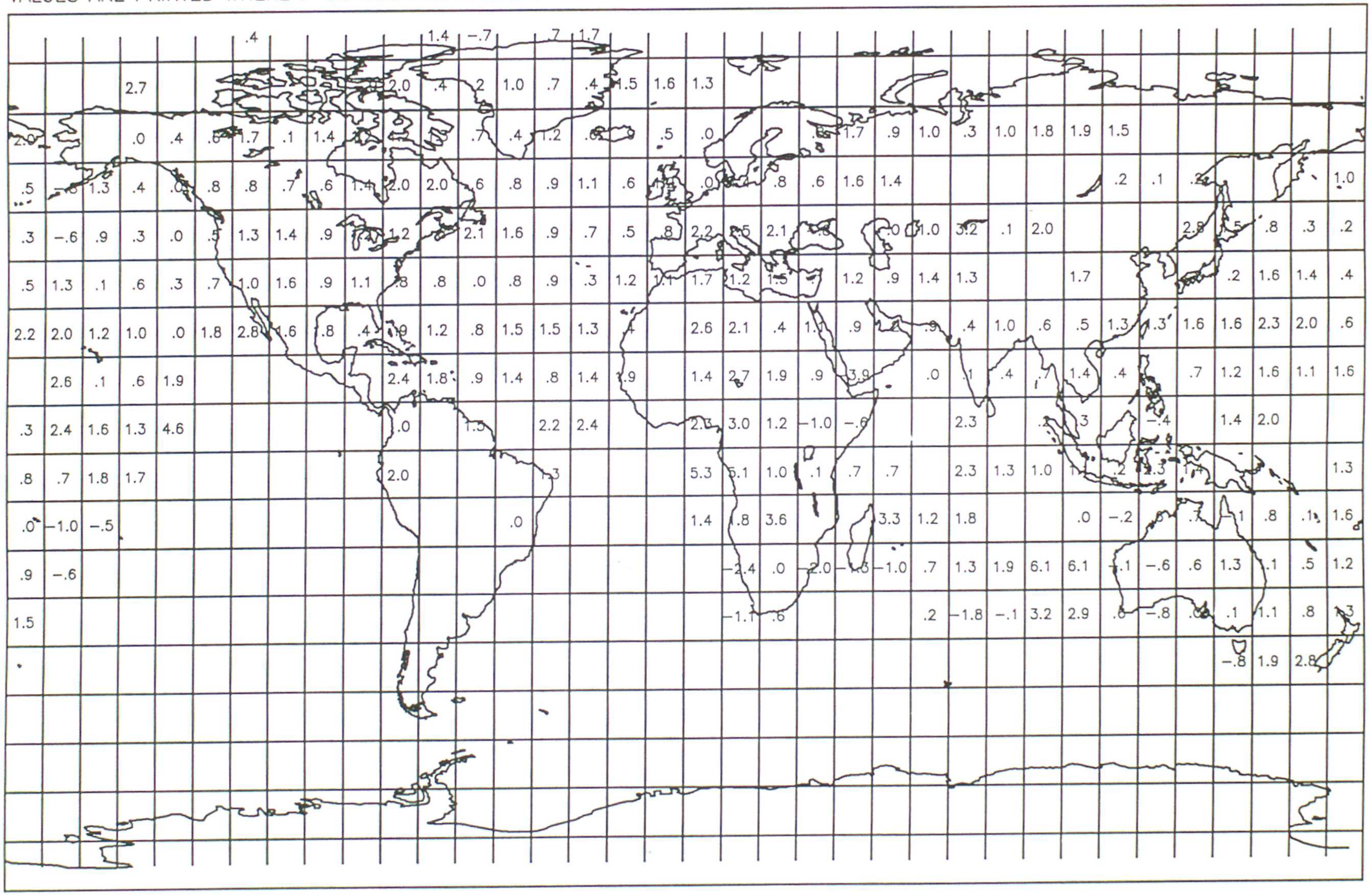


FIGURE 5

AIRCRAFT MEAN O−B WINDS BETWEEN 70 AND 500 HPA
SEPTEMBER 1996
OBSERVATIONS WITH O−B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O–B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
SEPTEMBER 1996
OBSERVATIONS WITH O–B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


.4 1.4 -.7 .7 1.7
2.7 2.0 .4 .2 1.0 .7 .4 1.5 1.6 1.3
2.0 .0 .4 .6 1.7 .1 1.4 .7 .4 1.2 .6 .9 .5 .0 .6 1.7 .9 1.0 .3 1.0 1.8 1.9 1.5
.5 -.6 1.3 .4 .0 .8 .8 .7 .6 1.4 2.0 2.0 .6 .8 .9 1.1 .6 1.4 .0 .4 .8 .6 1.6 1.4 .2 .1 .2 1.0
.3 -.6 .9 .3 .0 .5 1.3 1.4 .9 .4 1.2 2.1 1.6 .9 .7 .5 .8 2.2 2.5 2.1 1.8 .0 1.0 3.2 .1 2.0 2.8 .5 .8 .3 .2
.5 1.3 .1 .6 .3 .7 1.0 1.6 .9 1.1 .8 .8 .0 .8 .9 .3 1.2 1.1 1.7 1.2 1.5 .7 1.2 .9 1.4 1.3 1.7 .2 1.6 1.4 .4
2.2 2.0 1.2 1.0 .0 1.8 2.8 1.6 .8 .4 .9 1.2 .8 1.5 1.5 1.3 .4 2.6 2.1 .4 1.1 .9 .2 .9 .4 1.0 .6 .5 1.3 1.3 1.6 1.6 2.3 2.0 .6
2.6 .1 .6 1.9 2.4 1.8 .9 1.4 .8 1.4 1.9 1.4 2.7 1.9 .9 3.9 .0 .1 .4 .7 1.4 .4 .7 1.2 1.6 1.1 1.6
.3 2.4 1.6 1.3 4.6 .0 1.3 2.2 2.4 2.3 3.0 1.2 -1.0 -.6 2.3 .2 .3 -.4 1.4 2.0
.8 .7 1.8 1.7 2.0 1.3 5.3 5.1 1.0 .1 .7 .7 2.3 1.3 1.0 1.1 .2 1.3 1.4 1.3
.0 -1.0 -.5 .0 1.4 1.8 3.6 3.3 1.2 1.8 .0 -.2 .7 .1 .8 .1 1.6
.9 -.6 -2.4 .0 -2.0 -1.3 -1.0 .7 1.3 1.9 6.1 6.1 -.1 -.6 .6 1.3 .1 .5 1.2
1.5 -1.1 .6 .2 -1.8 -.1 3.2 2.9 .6 -.8 .6 .1 1.1 .8 .3
-.8 1.9 2.8

AIRCRAFT : RMS O–B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
SEPTEMBER 1996
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

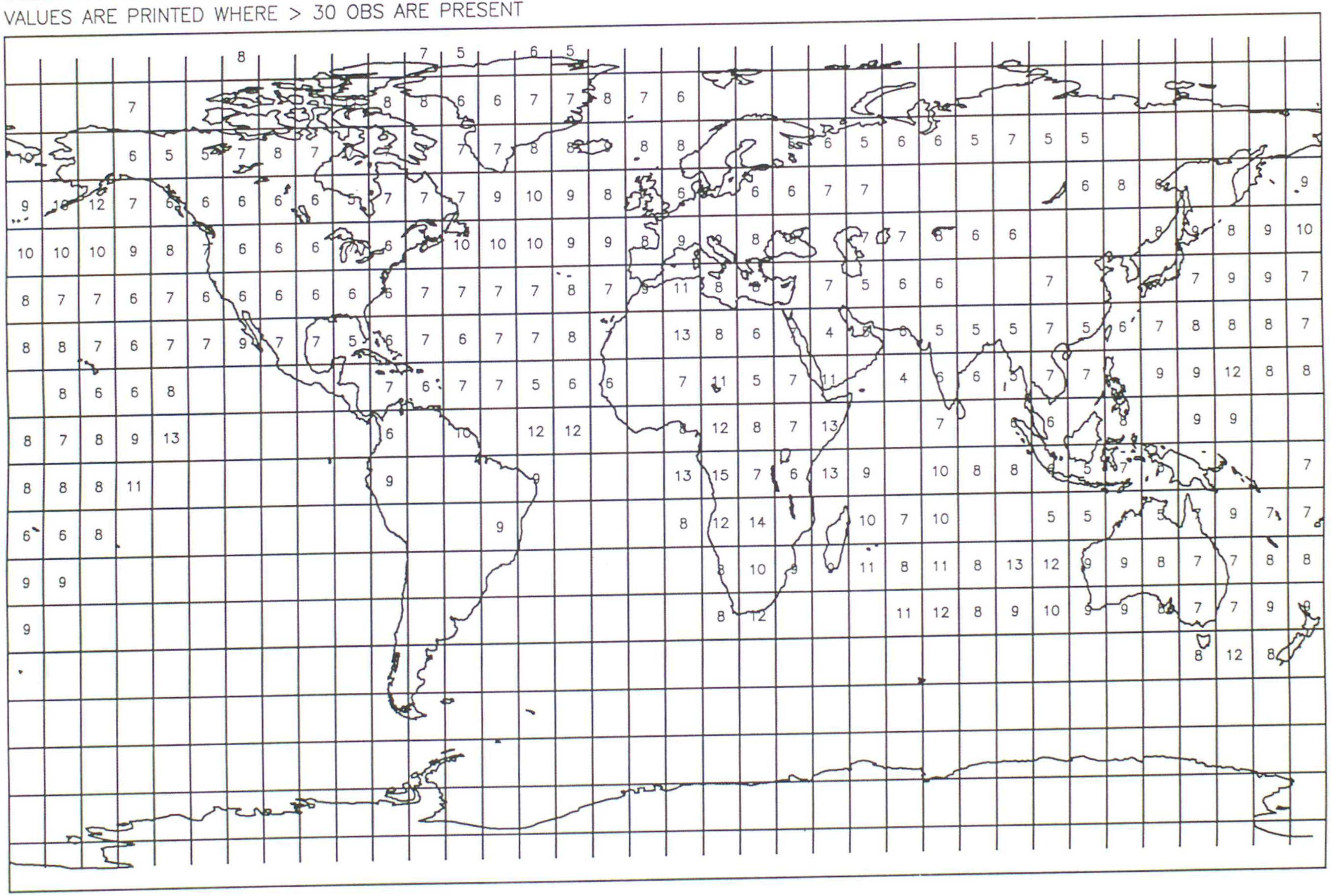


TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 30.0 hPa

Element monitored :GEOPOTENTIAL HEIGHT IN metres

Parameters monitored

- :NUM OBS :Number of observations available at level shown during period.
- :NUM GROSS :Number of gross errors at level shown duringperiod.
- :% REJ :Percentage of observations rejected by quality control at level shown during period.
- :SD :SD of difference of observations from background values at level shown excluding those with gross errors.
- :BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.
- :RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
- :NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.1

SELECTION CRITERIA : ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
26258	00	Z	400	58/ 28	14	1	64.9	43.4	78.1	7
33791	12	Z	250	43/ 33	23	2	97.0	-64.6	116.5	9
37018	12	Z	200	44/ 39	28	0	36.2	88.0	95.1	8
41977	00	Z	850	22/ 92	14	0	36.2	4.0	36.4	7
42361	00	Z	30	26/ 78	10	0	72.8	205.6	218.1	5
42369	00	Z	70	27/ 81	16	3	199.7	67.6	210.8	8
42369	12	Z	50	27/ 81	9	1	96.1	216.7	237.0	8
42379	00	Z	50	27/ 83	18	0	151.8	111.8	188.5	10
42379	12	Z	30	27/ 83	15	0	146.6	190.0	240.0	10
42492	00	Z	70	26/ 85	16	0	120.4	88.8	149.6	7
42701	00	Z	70	23/ 85	16	0	148.9	62.3	161.3	4
42724	12	Z	150	24/ 91	10	0	85.4	-85.5	120.9	6
42874	00	Z	200	21/ 82	16	0	71.5	-33.3	78.8	7
42874	12	Z	100	21/ 82	8	2	113.3	72.6	134.6	5
42971	00	Z	100	20/ 86	21	0	111.0	52.7	122.9	4
42971	12	Z	70	20/ 86	21	0	153.3	3.9	153.4	6
43014	12	Z	150	20/ 75	10	0	87.4	75.6	115.5	5
43128	00	Z	100	17/ 78	11	0	120.5	-81.1	145.2	6
43192	00	Z	70	15/ 74	9	1	113.0	-116.1	162.0	6
43279	00	Z	200	13/ 80	24	0	69.5	-80.0	106.0	8
43311	00	Z	200	11/ 73	13	1	77.9	77.3	109.7	5
43353	00	Z	100	10/ 76	12	1	73.2	-145.8	163.2	7
43353	12	Z	150	10/ 76	14	0	112.3	-11.4	112.8	5
43371	00	Z	50	8/ 77	16	0	93.4	-149.7	176.5	6
50774	00	Z	200	48/ 129	30	0	22.6	75.4	78.7	4
52836	00	Z	150	36/ 98	30	0	46.9	83.4	95.7	4
52836	12	Z	100	36/ 98	23	0	52.3	129.1	139.3	4
54218	00	Z	150	42/ 119	29	0	26.7	89.5	93.4	4
54497	00	Z	30	40/ 124	17	0	139.3	163.1	214.5	8
54497	12	Z	70	40/ 124	12	1	72.6	116.0	136.9	4
55591	12	Z	100	30/ 91	16	0	40.5	146.2	151.7	5
56294	00	Z	100	31/ 104	27	0	36.7	103.5	109.8	4
57083	00	Z	150	35/ 114	28	0	23.1	96.9	99.6	5
57516	00	Z	100	30/ 106	27	0	52.4	122.2	133.0	4
57679	00	Z	100	28/ 113	20	0	38.1	126.7	132.3	4
57749	00	Z	100	28/ 110	29	0	48.4	129.7	138.4	4
58665	00	Z	100	29/ 121	29	0	40.8	117.8	124.6	4
60490	12	Z	250	36/ -1	5	14	31.4	-176.6	179.4	4
61831	12	Z	250	10/ -14	14	0	15.6	-162.1	162.8	6
61902	12	Z	100	-8/ -14	13	1	78.4	127.3	149.5	5
62306	00	Z	70	31/ 27	18	4	112.5	216.8	244.2	5
62306	12	Z	150	31/ 27	23	3	101.0	135.6	169.0	9
62414	00	Z	30	24/ 33	16	2	137.3	179.9	226.3	5
88889	12	Z	300	-52/ -58	30	0	36.4	73.7	82.2	4
89664	00	Z	850	-78/ 167	19	0	15.9	-41.6	44.5	4
96163	00	Z	100	-1/ 100	10	0	134.3	5.3	134.4	4
96237	00	Z	200	-2/ 106	24	0	85.4	-60.3	104.6	6
97724	00	Z	150	-4/ 128	21	0	101.4	-17.3	102.8	5

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – SEPTEMBER 1996

FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1332

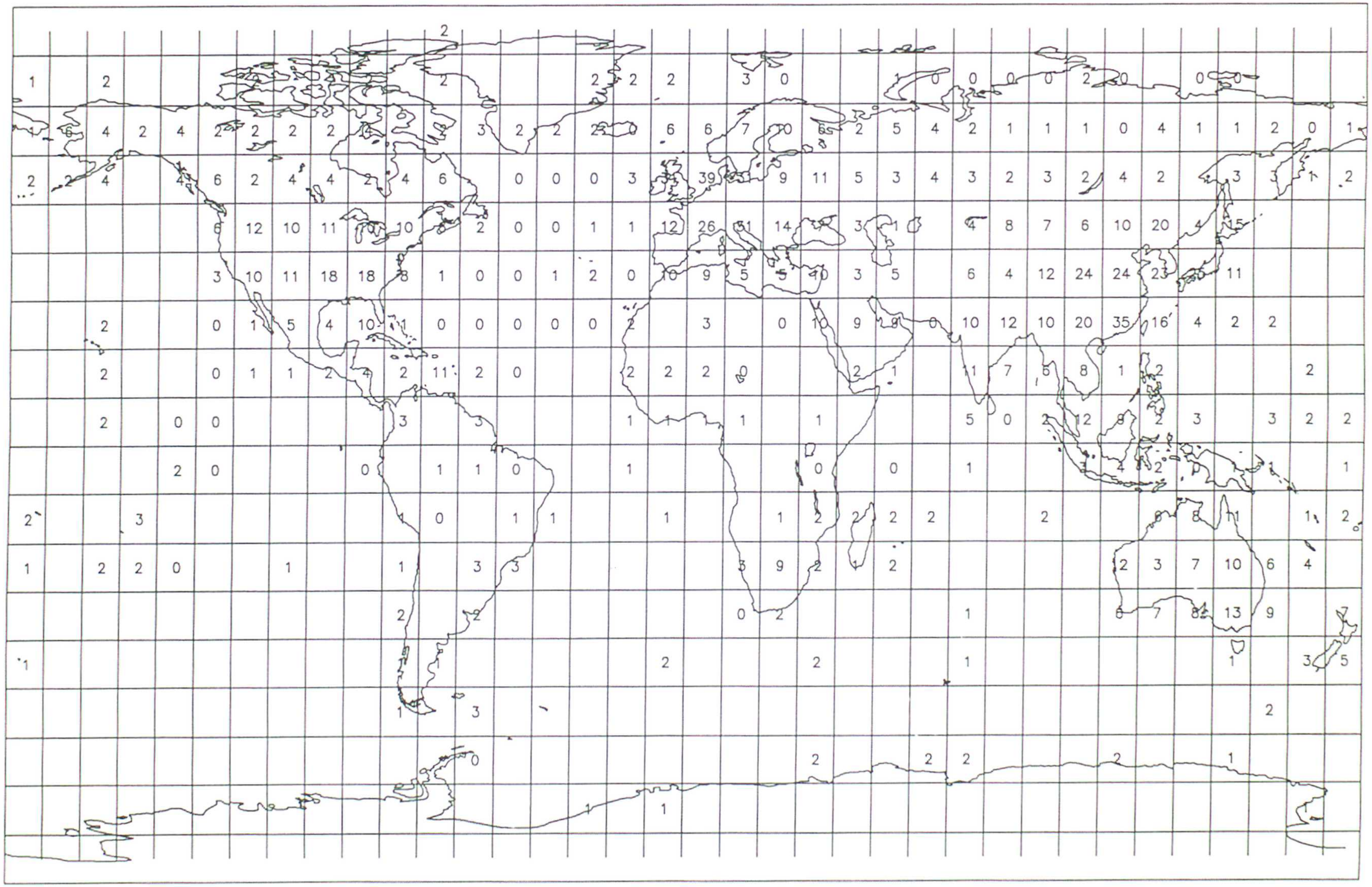

2
1 2 2 2 2 2 3 0 1 0 0 0 0 2 0 0 0
1 6 4 2 4 2 2 2 2 2 3 2 2 2 0 6 6 7 0 6 2 5 4 2 1 1 1 0 4 1 1 2 0 1
2 2 4 4 6 2 4 4 2 4 6 0 0 0 3 3 39 1 9 11 5 3 4 3 2 3 2 4 2 3 3 1 2
6 12 10 11 10 2 0 0 1 1 12 26 31 14 3 1 4 8 7 6 10 20 4 15
3 10 11 18 18 8 1 0 0 1 2 0 10 9 5 5 10 3 5 6 4 12 24 24 23 11
2 0 1 5 4 10 1 0 0 0 0 0 2 3 0 10 9 9 0 10 12 10 20 35 16 4 2 2
2 0 1 1 2 4 2 11 2 0 2 2 2 0 2 1 11 7 6 8 1 2 2
2 0 0 3 3 1 1 1 1 5 0 2 12 8 2 3 3 2 2
2 0 0 1 1 0 1 0 0 1 4 2 1
2 3 1 0 1 1 1 1 2 2 2 2 2 8 8 11 1 2
1 2 2 0 1 1 3 3 3 9 2 1 2 2 3 7 10 6 4
2 2 0 2 1 6 7 8 13 9 7
1 2 2 1 1 3 5
1 3 2
0 2 2 2 2 1
1 1 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : $\geq$ 10 observations and $\geq$ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
82965	12	V	150	-10/ -56	17	0	29	10.3	-1.3	17.1	1

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – SEPTEMBER 1996

FIGURE 9

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1198

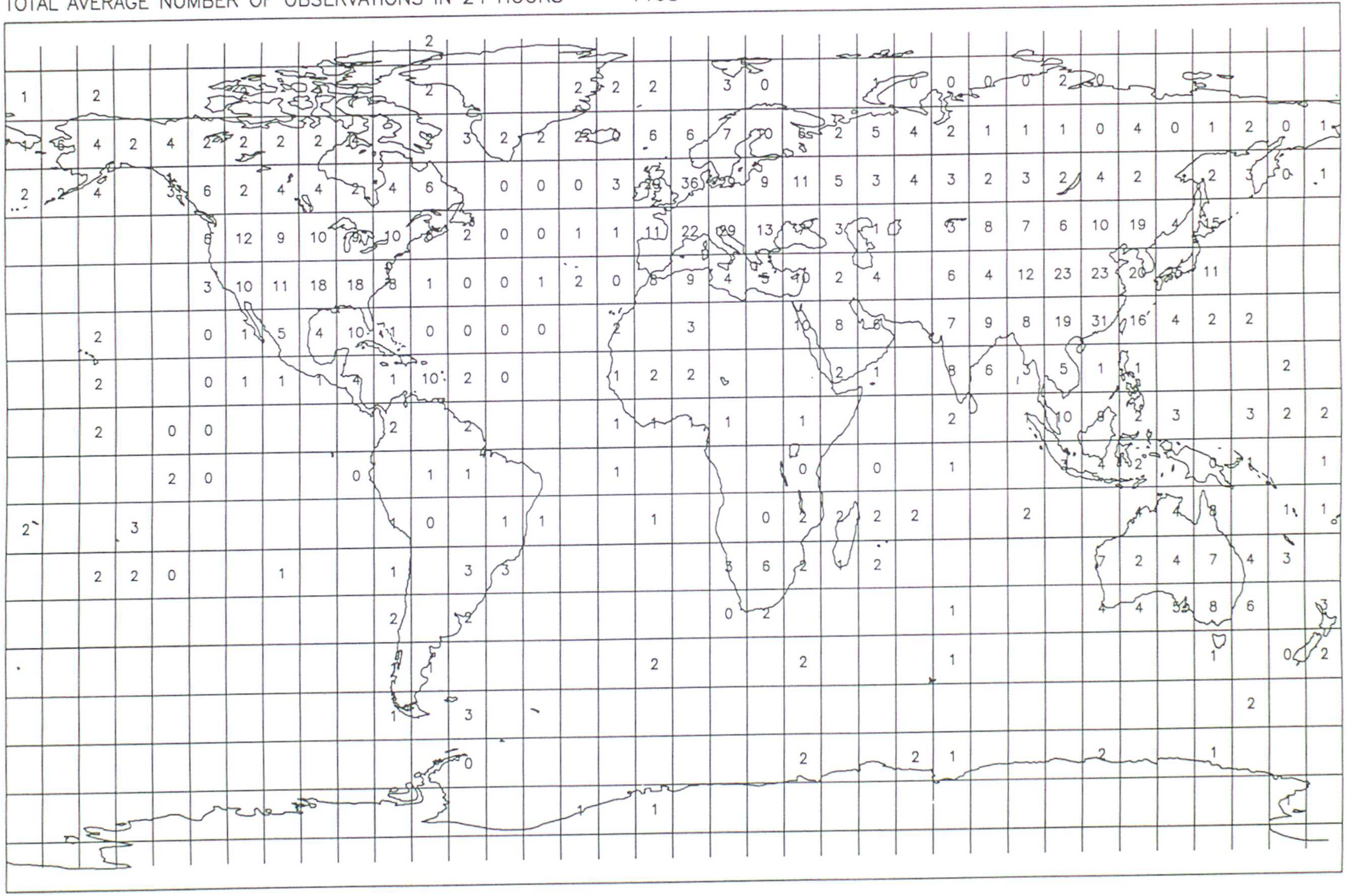

2
1 2 2 2 2 2 3 0 0 0 0 0 2 0
6 4 2 4 2 2 2 2 4 3 2 2 2 6 6 7 0 65 2 5 4 2 1 1 1 0 4 0 1 2 0 1
2 2 4 3 6 2 4 4 2 4 6 0 0 0 3 29 36 29 9 11 5 3 4 3 2 3 2 4 2 2 3 0 1
6 12 9 10 9 10 8 2 0 0 1 1 11 22 29 13 3 1 3 8 7 6 10 19 4 15
3 10 11 18 18 8 1 0 0 1 2 0 8 9 4 5 40 2 4 6 4 12 23 23 20 11
2 0 1 5 4 10 1 0 0 0 0 2 3 10 8 6 7 9 8 19 31 16 4 2 2
2 0 1 1 1 4 1 10 2 0 1 2 2 2 1 8 6 3 5 1 1 2
2 0 0 2 2 1 1 1 1 2 10 8 2 3 3 2 2
2 0 0 1 1 1 0 0 1 4 4 2 0 1 1
2 3 1 0 1 1 1 0 2 2 2 2 2 4 8 1 1
2 2 0 1 1 3 3 3 6 2 1 2 7 2 4 7 4 3
2 2 0 2 1 4 4 35 8 6 3
2 2 1 1 0 2
1 3 2
0 2 2 1 2 1
1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA

:NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
42809	00	DD	23/ 88	13	14.3	7.6	27.2
48407	00	DD	15/ 105	17	-20.0	7.3	22.1
48855	00	DD	16/ 108	17	-11.5	6.0	21.7
53614	00	DD	38/ 106	28	-12.8	5.9	10.3
53614	12	DD	38/ 106	28	-12.8	4.0	8.4
55591	00	DD	30/ 91	16	-23.6	7.6	19.2
55591	12	DD	30/ 91	17	-38.2	3.8	22.9
59134	12	DD	24/ 118	19	11.7	5.5	18.4
60490	12	DD	36/ -1	18	-10.0	3.0	10.9
72476	00	DD	39/-109	26	-16.3	7.7	12.8
72476	12	DD	39/-109	26	-12.8	3.7	10.6
96315	12	DD	5/ 115	23	10.1	8.0	18.4
96935	00	DD	-7/ 113	21	27.6	3.7	15.3
96935	12	DD	-7/ 113	22	26.2	4.6	14.5

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: September, 1996

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES, METEOSAT, GMS, INSAT.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

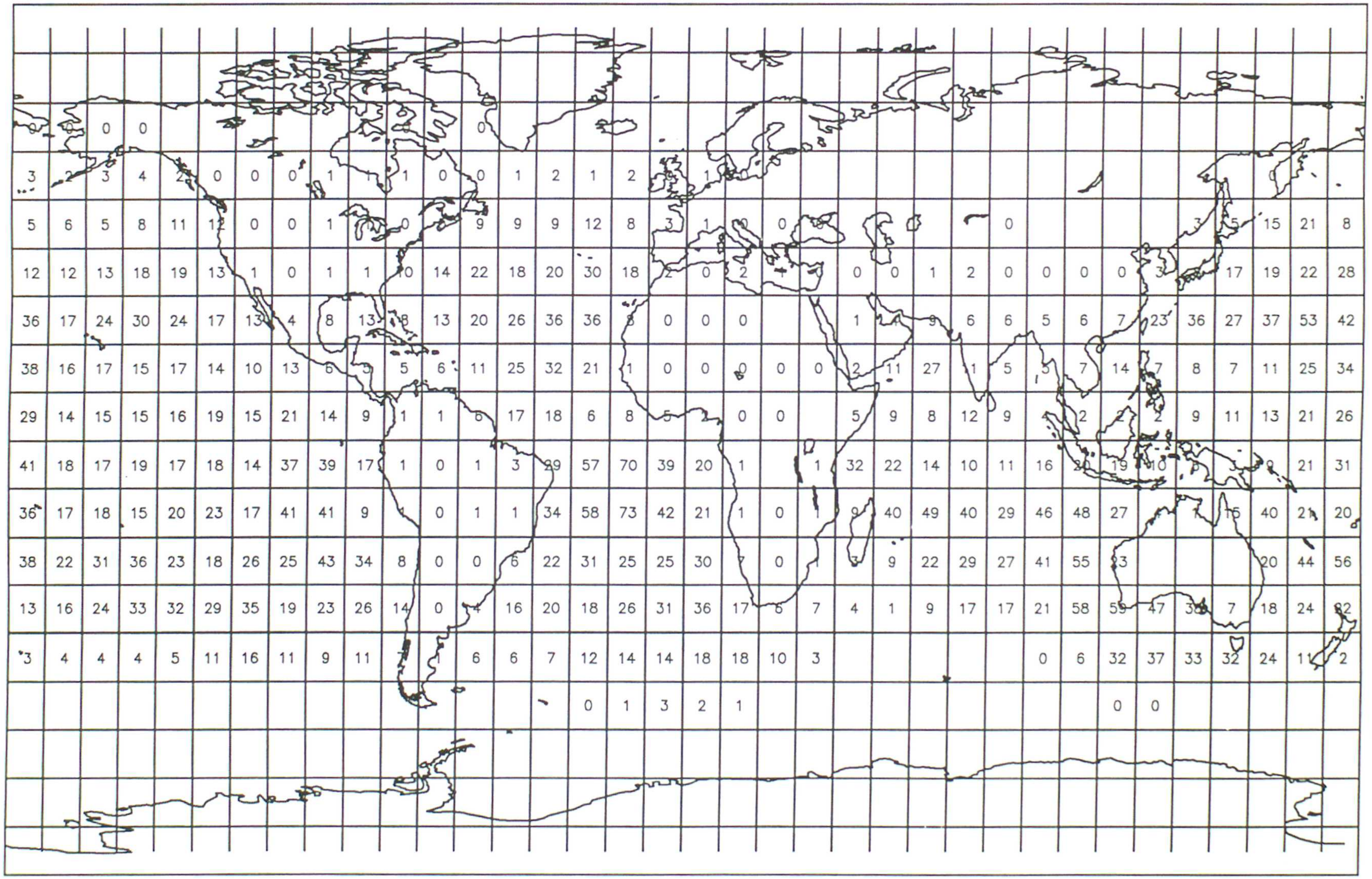
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

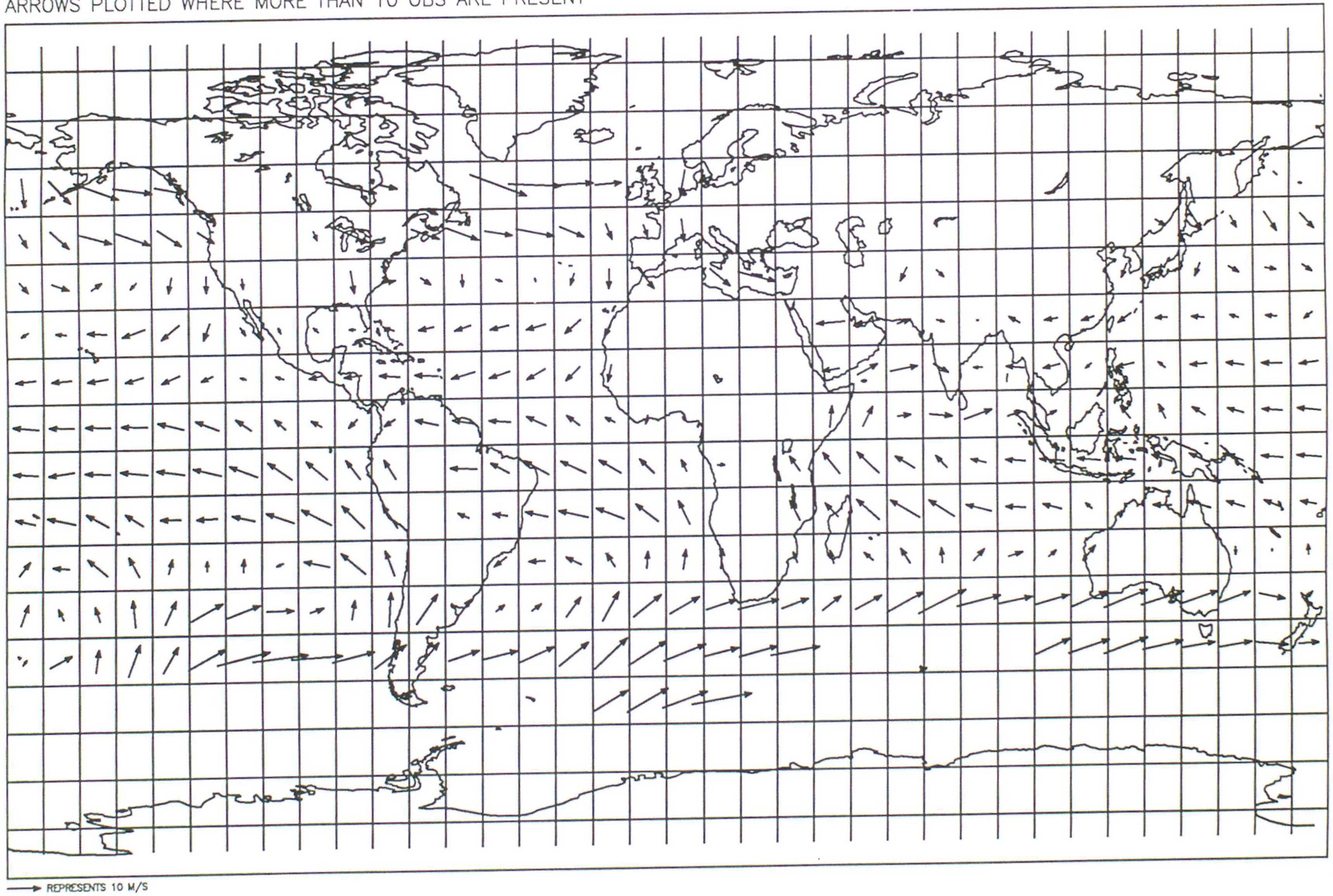
:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
SEPTEMBER 1996



SATOB VECTOR MEAN WINDS BETWEEN 701–1000 HPA
SEPTEMBER 1996
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11


→ REPRESENTS 10 M/S

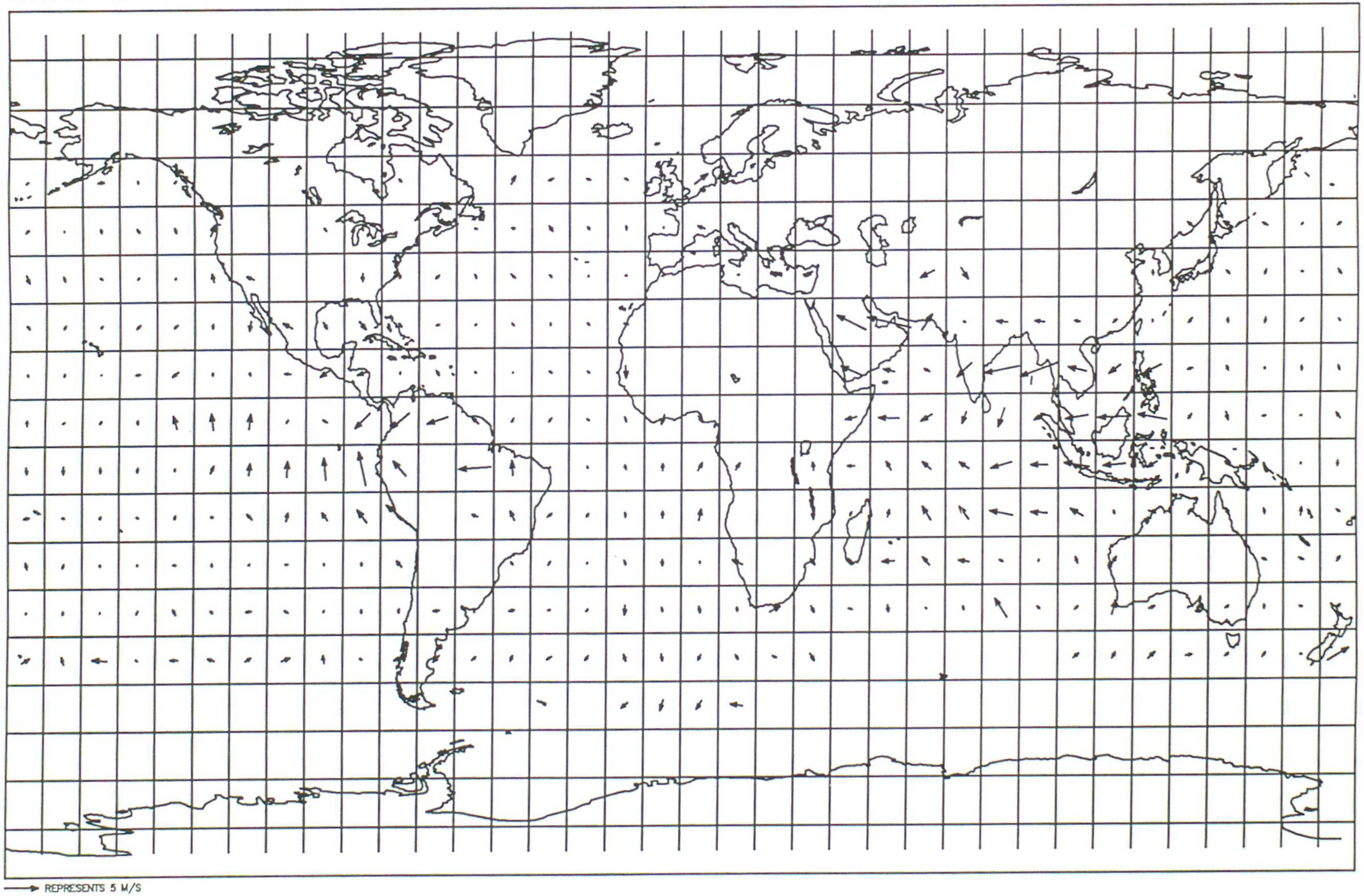
SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA

SEPTEMBER 1996

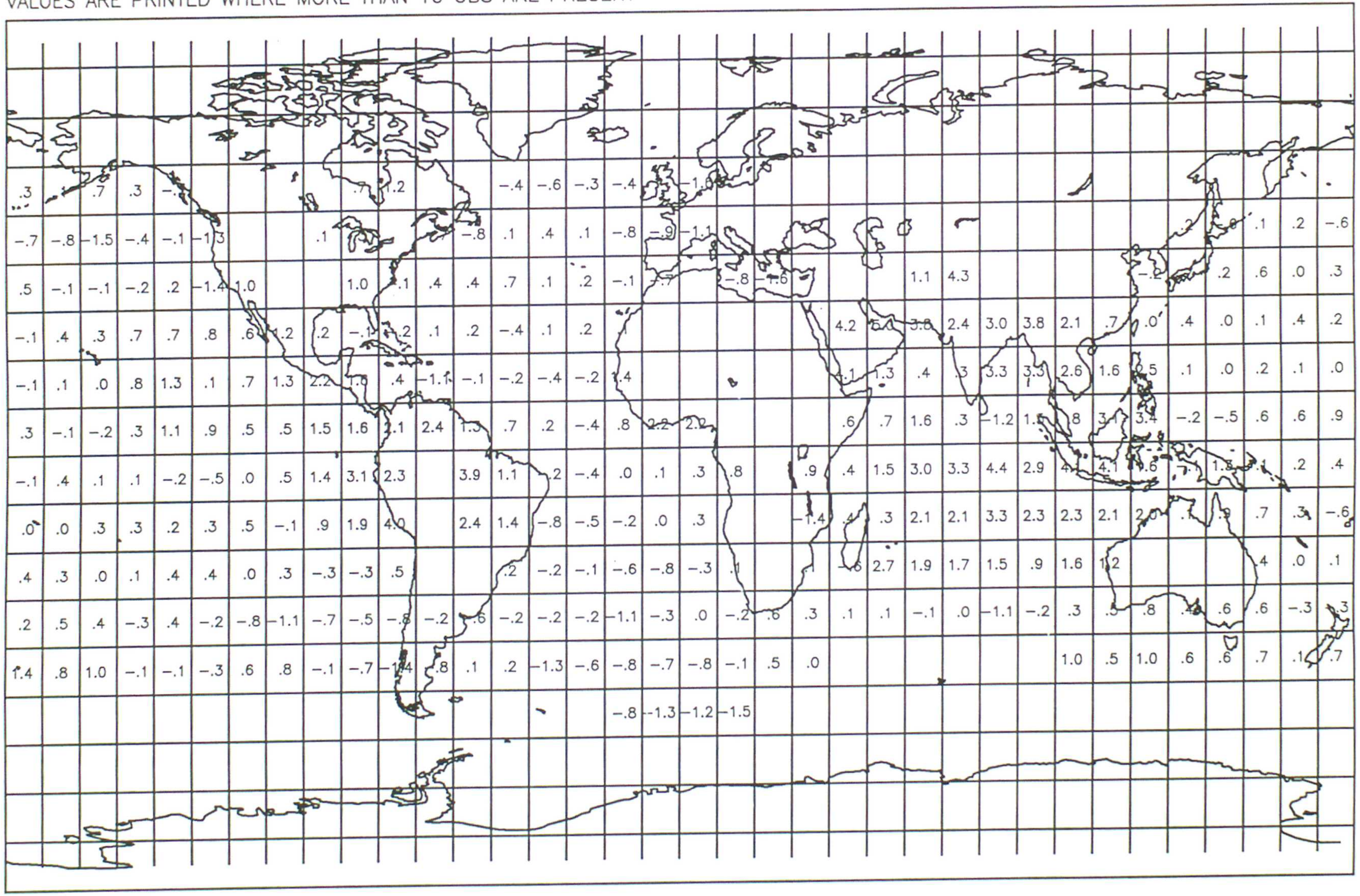
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

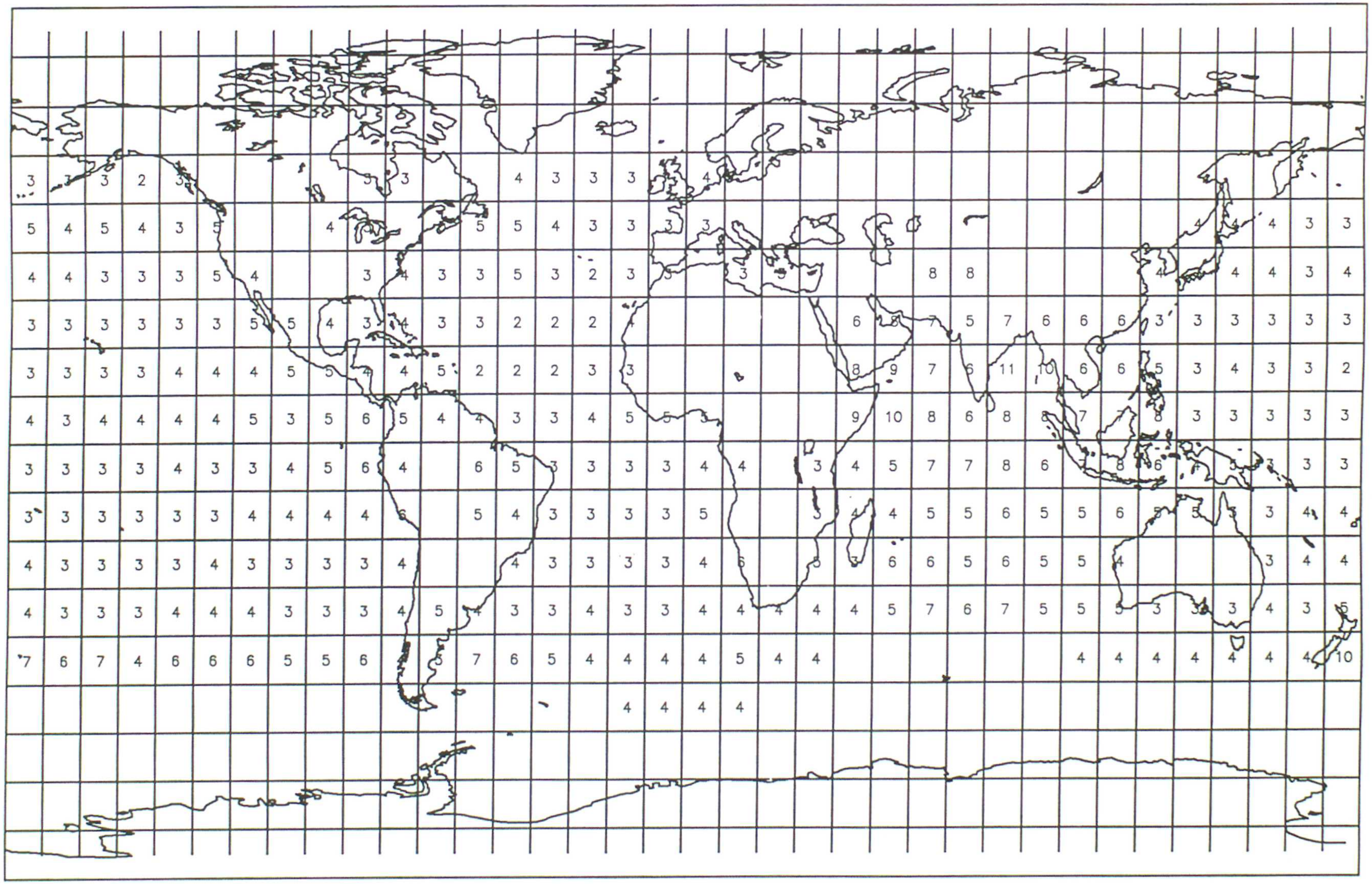
FIGURE 12



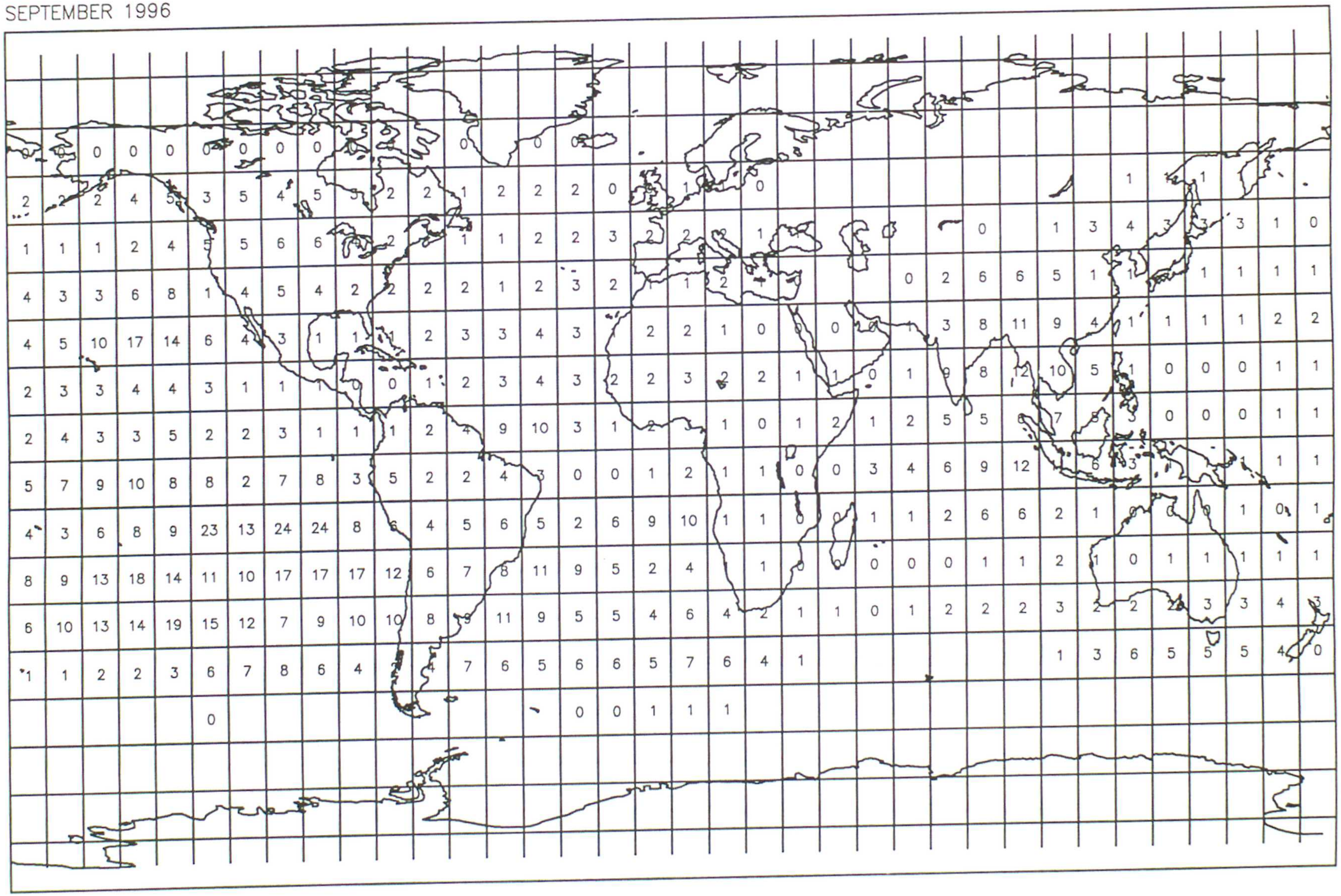
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
SEPTEMBER 1996
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.3 .7 .3 .7 1.2 -.4 -.6 -.3 -.4 -1.6
-.7 -.8 -1.5 -.4 -.1 -1.3 .1 -.8 .1 .4 .1 -.8 -.9 -1.1 .2 .1 .2 -.6
.5 -.1 -.1 -.2 .2 -1.4 1.0 1.0 .1 .4 .4 .7 .1 .2 -.1 -.7 -.8 -1.6 1.1 4.3 -.2 .2 .6 .0 .3
-.1 .4 .3 .7 .7 .8 .6 1.2 .2 -.1 .2 .1 .2 -.4 .1 .2 4.2 5.0 3.8 2.4 3.0 3.8 2.1 .7 .0 .4 .0 .1 .4 .2
-.1 .1 .0 .8 1.3 .1 .7 1.3 2.2 1.6 .4 -1.1 -.1 -.2 -.4 -.2 1.4 4.1 1.3 .4 .3 3.3 3.3 2.6 1.6 2.5 .1 .0 .2 .1 .0
.3 -.1 -.2 .3 1.1 .9 .5 .5 1.5 1.6 2.1 2.4 1.3 .7 .2 -.4 .8 2.2 2.2 .6 .7 1.6 .3 -1.2 1.5 .8 3.1 3.4 -.2 -.5 .6 .6 .9
-.1 .4 .1 .1 -.2 -.5 .0 .5 1.4 3.1 2.3 3.9 1.1 .2 -.4 .0 .1 .3 .8 .9 .4 1.5 3.0 3.3 4.4 2.9 4.1 4.1 1.6 .7 1.3 .1 .2 .4
.0 .0 .3 .3 .2 .3 .5 -.1 .9 1.9 4.0 2.4 1.4 -.8 -.5 -.2 .0 .3 -1.4 .4 .3 2.1 2.1 3.3 2.3 2.3 2.1 2.0 .1 .9 .7 .3 -.6
.4 .3 .0 .1 .4 .4 .0 .3 -.3 -.3 .5 .2 -.2 -.1 -.6 -.8 -.3 .1 .1 -.6 2.7 1.9 1.7 1.5 .9 1.6 1.2 .4 .0 .1
.2 .5 .4 -.3 .4 -.2 -.8 -1.1 -.7 -.5 -.8 -.2 .6 -.2 -.2 -.2 -1.1 -.3 .0 -.2 .6 .3 .1 .1 -.1 .0 -1.1 -.2 .3 .5 .8 .4 .6 .6 -.3 .3
1.4 .8 1.0 -.1 -.1 -.3 .6 .8 -.1 -.7 -1.4 .8 .1 .2 -1.3 -.6 -.8 -.7 -.8 -.1 .5 .0 1.0 .5 1.0 .6 .6 .7 .1 .7
-.8 -1.3 -1.2 -1.5

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
SEPTEMBER 1996
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
SEPTEMBER 1996


0 0 0 0 0 0 0 0 0 0 0 0 0 0
2 2 2 4 5 3 5 4 5 3 2 2 1 2 2 2 0 0 1 1 0 1 1
1 1 1 2 4 5 5 6 6 0 2 1 1 2 2 3 2 2 2 1 0 1 3 4 3 3 3 1 0
4 3 3 6 8 1 4 5 4 2 2 2 2 1 2 3 2 1 1 2 1 0 0 2 6 6 5 1 1 1 1 1 1
4 5 10 17 14 6 4 3 1 1 1 2 3 3 4 3 1 2 2 1 0 0 0 0 1 3 8 11 9 4 1 1 1 1 2 2
2 3 3 4 4 3 1 1 1 0 0 1 2 3 4 3 2 2 3 2 2 1 1 0 1 9 8 12 10 5 1 0 0 0 1 1
2 4 3 3 5 2 2 3 1 1 1 2 4 9 10 3 1 2 3 1 0 1 2 1 2 5 5 6 7 8 3 0 0 0 1 1
5 7 9 10 8 8 2 7 8 3 5 2 2 4 3 0 0 1 2 1 1 0 0 3 4 6 9 12 1 6 3 1 1 1 1
4 3 6 8 9 23 13 24 24 8 6 4 5 6 5 2 6 9 10 1 1 0 0 1 1 2 6 6 2 1 0 0 0 1 0 1
8 9 13 18 14 11 10 17 17 17 12 6 7 8 11 9 5 2 4 1 0 0 0 0 0 1 1 2 1 0 1 1 1 1 1
6 10 13 14 19 15 12 7 9 10 10 8 9 11 9 5 5 4 6 4 2 1 1 0 1 2 2 2 3 2 2 2 3 3 4 3
1 1 2 2 3 6 7 8 6 4 4 7 6 5 6 6 5 7 6 4 1 1 3 6 5 5 5 4 0
0 0 0 1 1 1

SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA
SEPTEMBER 1996
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16

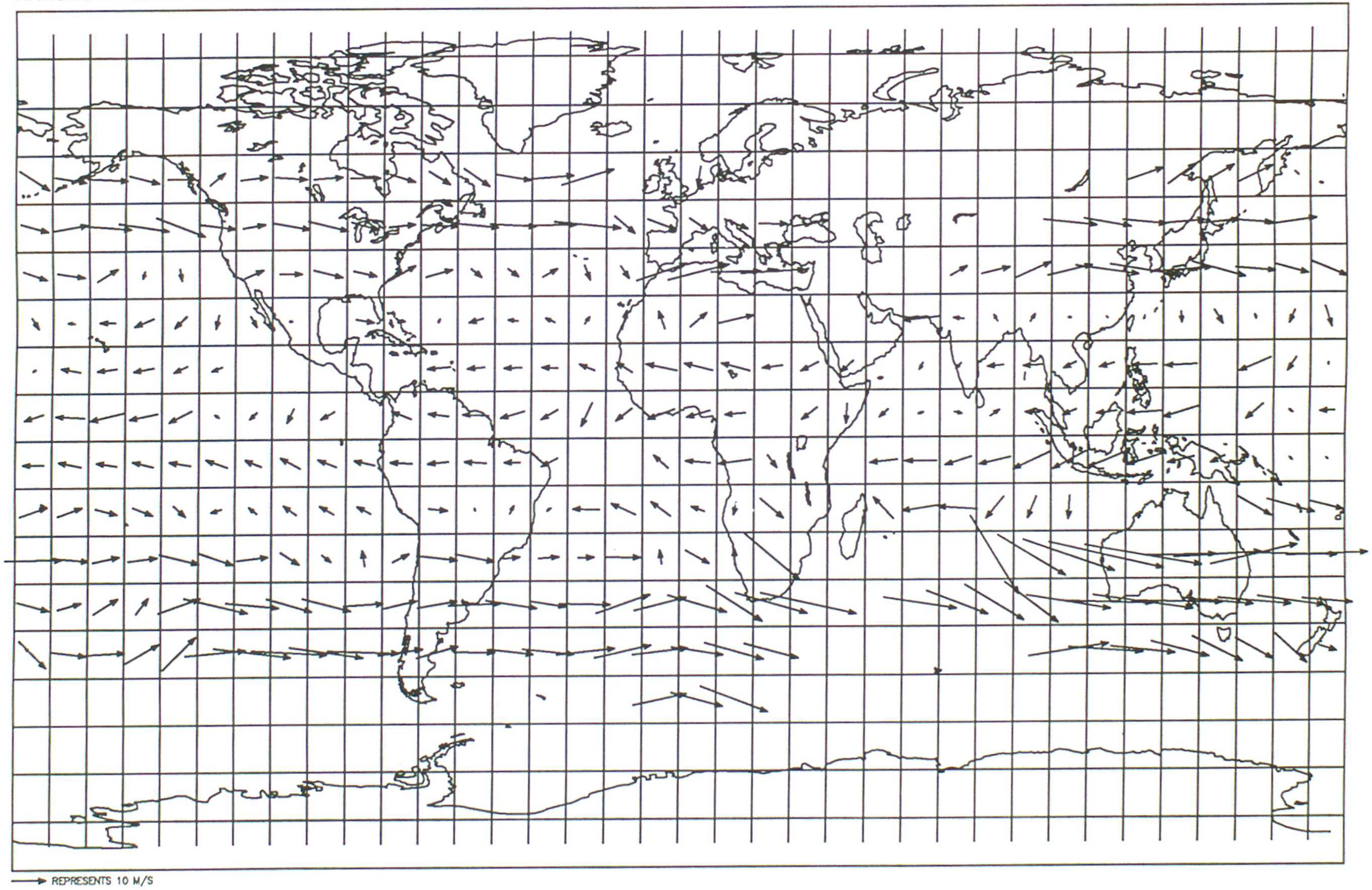
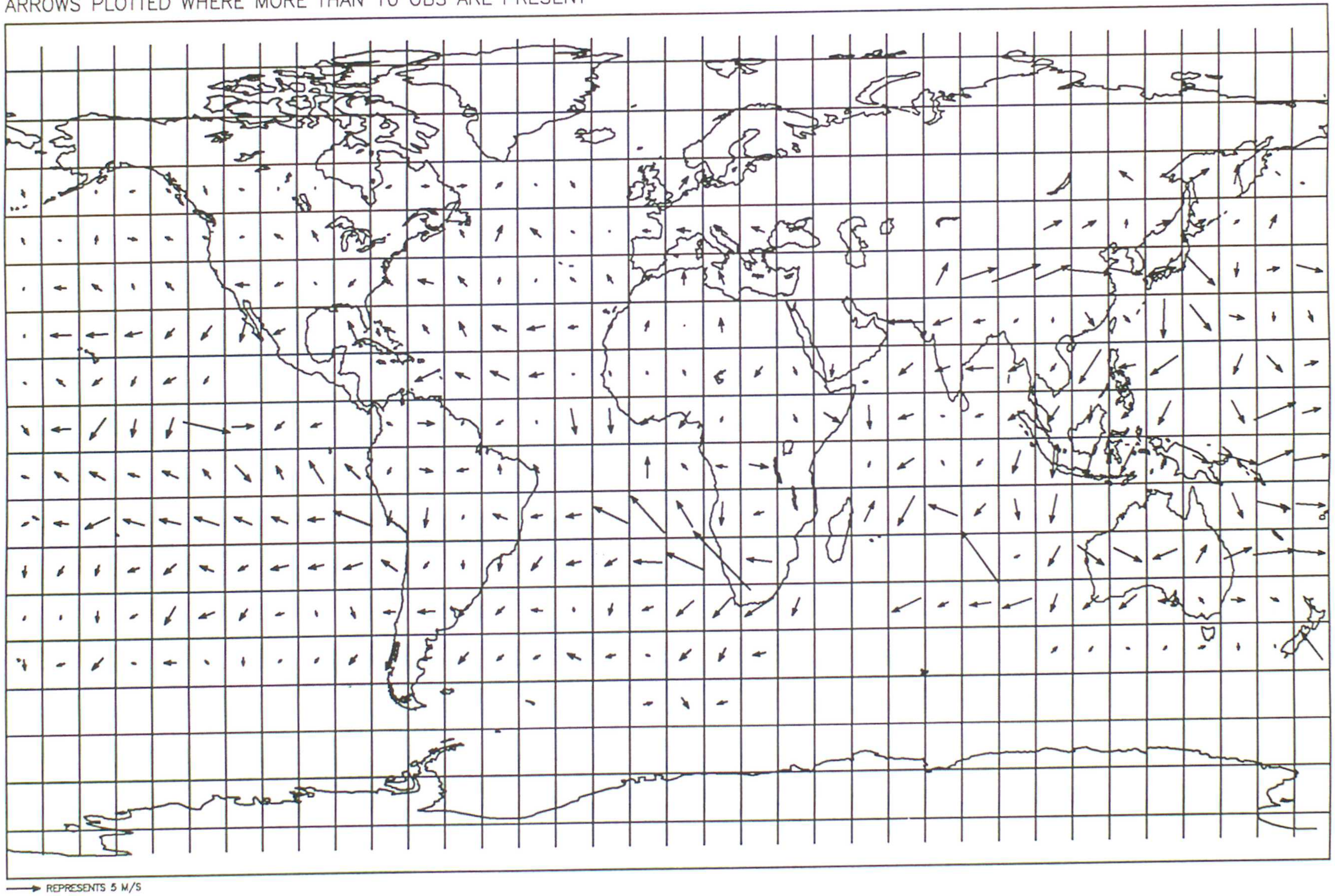
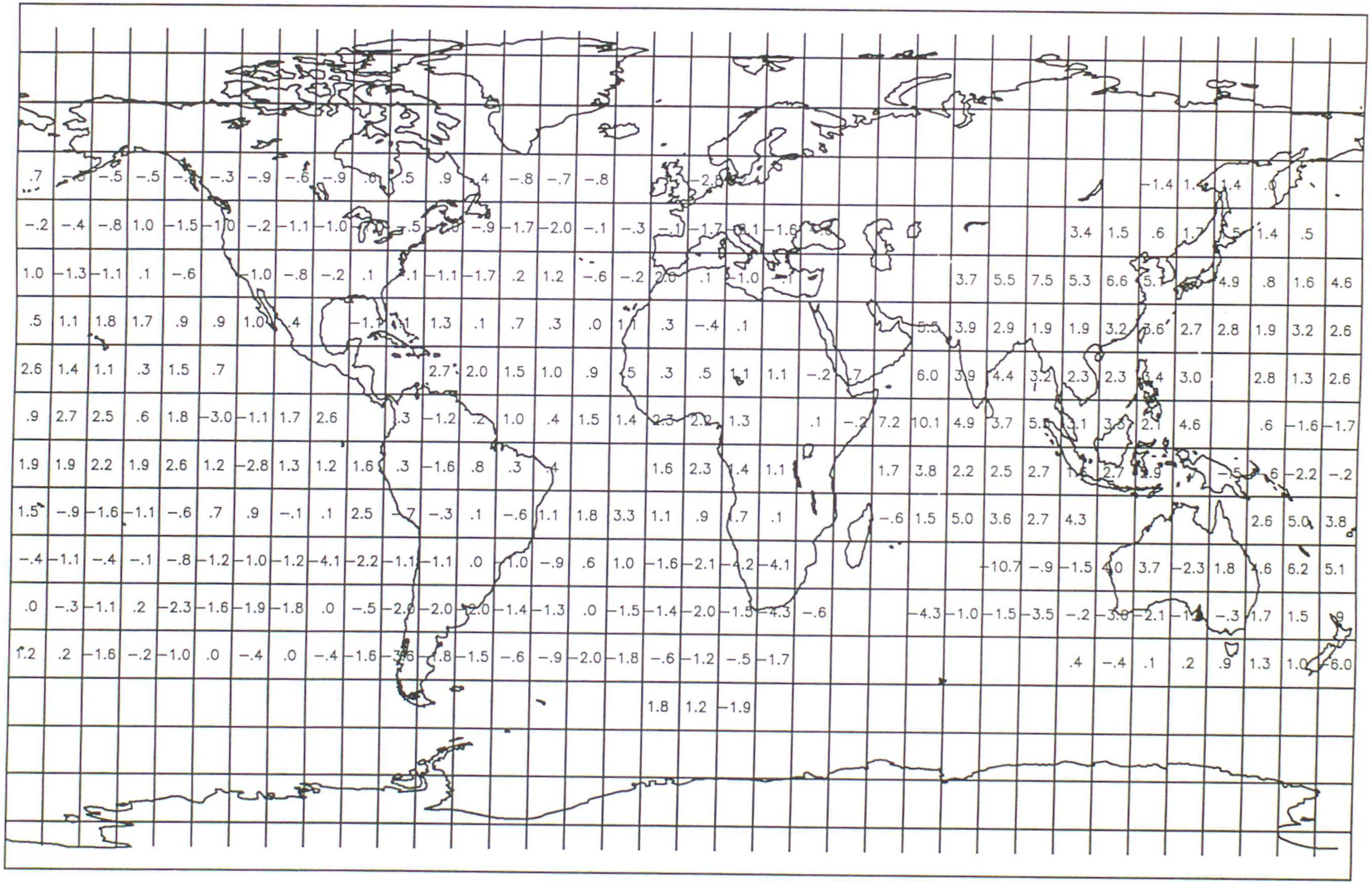

REPRESENTS 10 M/S

FIGURE 17

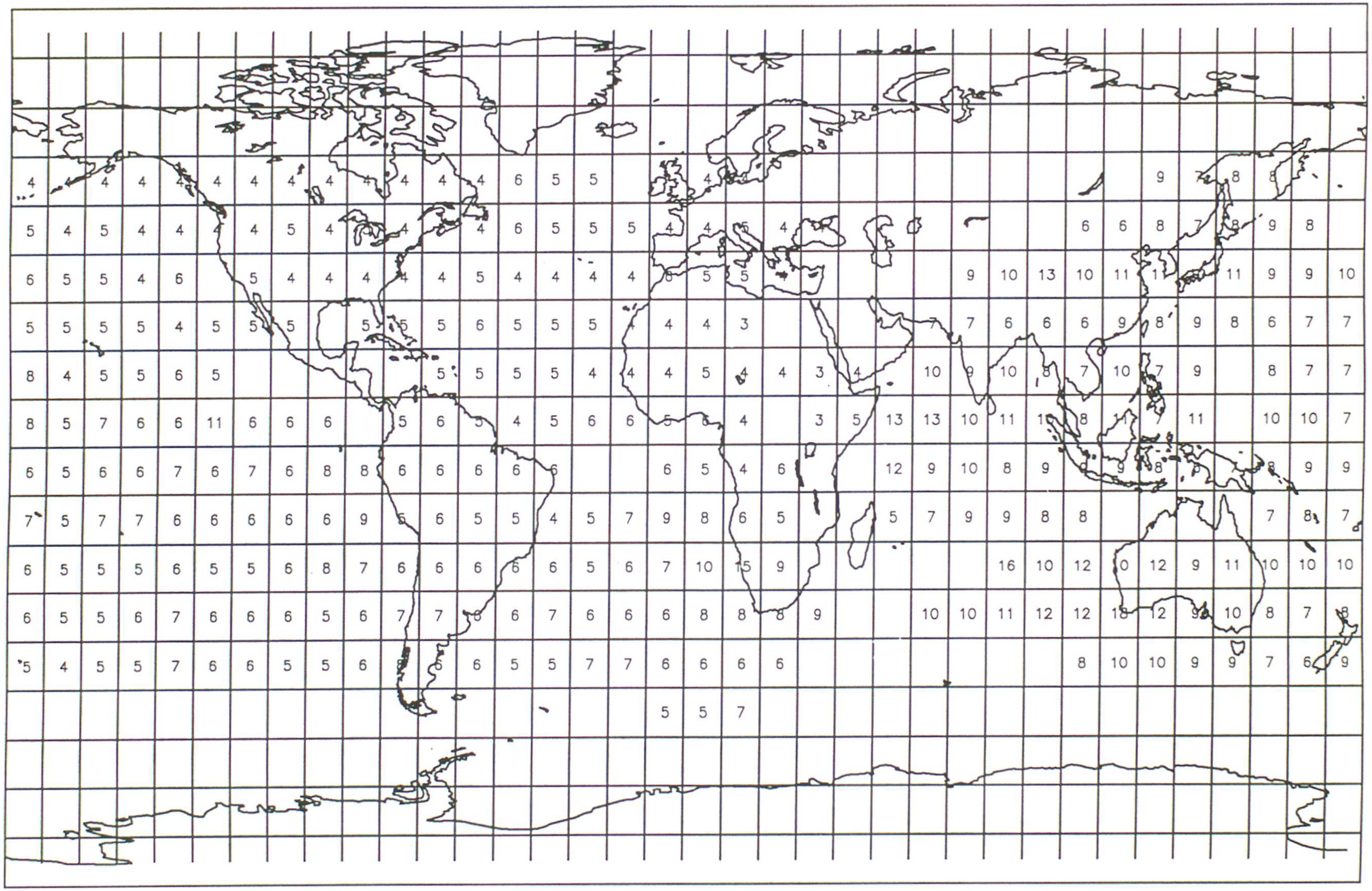
SATOB O−B VECTOR WIND DIFFERENCES BETWEEN 401−700 HPA
SEPTEMBER 1996
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT



SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
SEPTEMBER 1996
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.7 –.6 –.5 –.5 –.4 –.3 –.9 –.6 –.9 .0 .5 .9 .4 –.8 –.7 –.8 –2.8 –1.4 1.4 1.4 .0
–.2 –.4 –.8 1.0 –1.5 –1.0 –.2 –1.1 –1.0 –.7 .5 –.6 –.9 –1.7 –2.0 –.1 –.3 –.1 –1.7 .1 –1.6 3.4 1.5 .6 1.7 .5 1.4 .5
1.0 –1.3 –1.1 .1 –.6 –1.0 –.8 –.2 .1 .1 –1.1 –1.7 .2 1.2 –.6 –.2 2.0 .1 –1.0 –.1 3.7 5.5 7.5 5.3 6.6 5.1 4.9 .8 1.6 4.6
.5 1.1 1.8 1.7 .9 .9 1.0 .4 –1.1 .1 1.3 .1 .7 .3 .0 1.1 .3 –.4 .1 5.5 3.9 2.9 1.9 1.9 3.2 3.6 2.7 2.8 1.9 3.2 2.6
2.6 1.4 1.1 .3 1.5 .7 2.7 2.0 1.5 1.0 .9 .5 .3 .5 1.1 1.1 –.2 .7 6.0 3.9 4.4 3.2 2.3 2.3 3.4 3.0 2.8 1.3 2.6
.9 2.7 2.5 .6 1.8 –3.0 –1.1 1.7 2.6 .3 –1.2 .2 1.0 .4 1.5 1.4 2.3 2.2 1.3 .1 –.2 7.2 10.1 4.9 3.7 5.5 3.1 3.5 2.1 4.6 .6 –1.6 –1.7
1.9 1.9 2.2 1.9 2.6 1.2 –2.8 1.3 1.2 1.6 .3 –1.6 .8 .3 .4 1.6 2.3 1.4 1.1 1.7 3.8 2.2 2.5 2.7 1.6 2.7 2.9 –.5 .6 –2.2 –.2
1.5 –.9 –1.6 –1.1 –.6 .7 .9 –.1 .1 2.5 .7 –.3 .1 –.6 1.1 1.8 3.3 1.1 .9 .7 .1 –.6 1.5 5.0 3.6 2.7 4.3 2.6 5.0 3.8
–.4 –1.1 –.4 –.1 –.8 –1.2 –1.0 –1.2 –4.1 –2.2 –1.1 –1.1 .0 1.0 –.9 .6 1.0 –1.6 –2.1 –4.2 –4.1 –10.7 –.9 –1.5 4.0 3.7 –2.3 1.8 .6 6.2 5.1
.0 –.3 –1.1 .2 –2.3 –1.6 –1.9 –1.8 .0 –.5 –2.0 –2.0 –2.0 –1.4 –1.3 .0 –1.5 –1.4 –2.0 –1.5 –4.3 –.6 –4.3 –1.0 –1.5 –3.5 –.2 –3.0 –2.1 –1.4 –.3 1.7 1.5 .9
1.2 .2 –1.6 –.2 –1.0 .0 –.4 .0 –.4 –1.6 –3.6 –1.8 –1.5 –.6 –.9 –2.0 –1.8 –.6 –1.2 –.5 –1.7 .4 –.4 .1 .2 .9 1.3 1.0 –6.0
1.8 1.2 –1.9

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
SEPTEMBER 1996
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


4 4 4 4 4 4 4 4 4 4 4 4 6 5 5 4 9 7 8 8
5 4 5 4 4 4 4 5 4 4 4 4 6 5 5 5 4 4 5 4 6 6 8 7 8 9 8
6 5 5 4 6 5 4 4 4 4 4 5 4 4 4 4 6 5 5 9 10 13 10 11 1 11 9 9 10
5 5 5 5 4 5 5 5 5 5 5 6 5 5 5 4 4 4 3 7 7 6 6 6 9 8 9 8 6 7 7
8 4 5 5 6 5 5 5 5 5 4 4 4 5 4 4 3 4 10 9 10 8 7 10 7 9 8 7 7
8 5 7 6 6 11 6 6 6 5 6 5 4 5 6 6 5 6 4 3 5 13 13 10 11 10 8 1 7 11 10 10 7
6 5 6 6 7 6 7 6 8 8 6 6 6 6 6 6 5 4 6 12 9 10 8 9 9 9 8 8 9 9
7 5 7 7 6 6 6 6 6 9 5 6 5 5 4 5 7 9 8 6 5 5 7 9 9 8 8 7 8 7
6 5 5 5 6 5 5 6 8 7 6 6 6 6 6 5 6 7 10 15 9 16 10 12 10 12 9 11 10 10 10
6 5 5 6 7 6 6 6 5 6 7 7 8 6 7 6 6 6 8 8 8 9 10 10 11 12 12 13 12 9 10 8 7 8
5 4 5 5 7 6 6 5 5 6 8 6 6 5 5 7 7 6 6 6 6 8 10 10 9 9 7 6 9
5 5 7

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
SEPTEMBER 1996

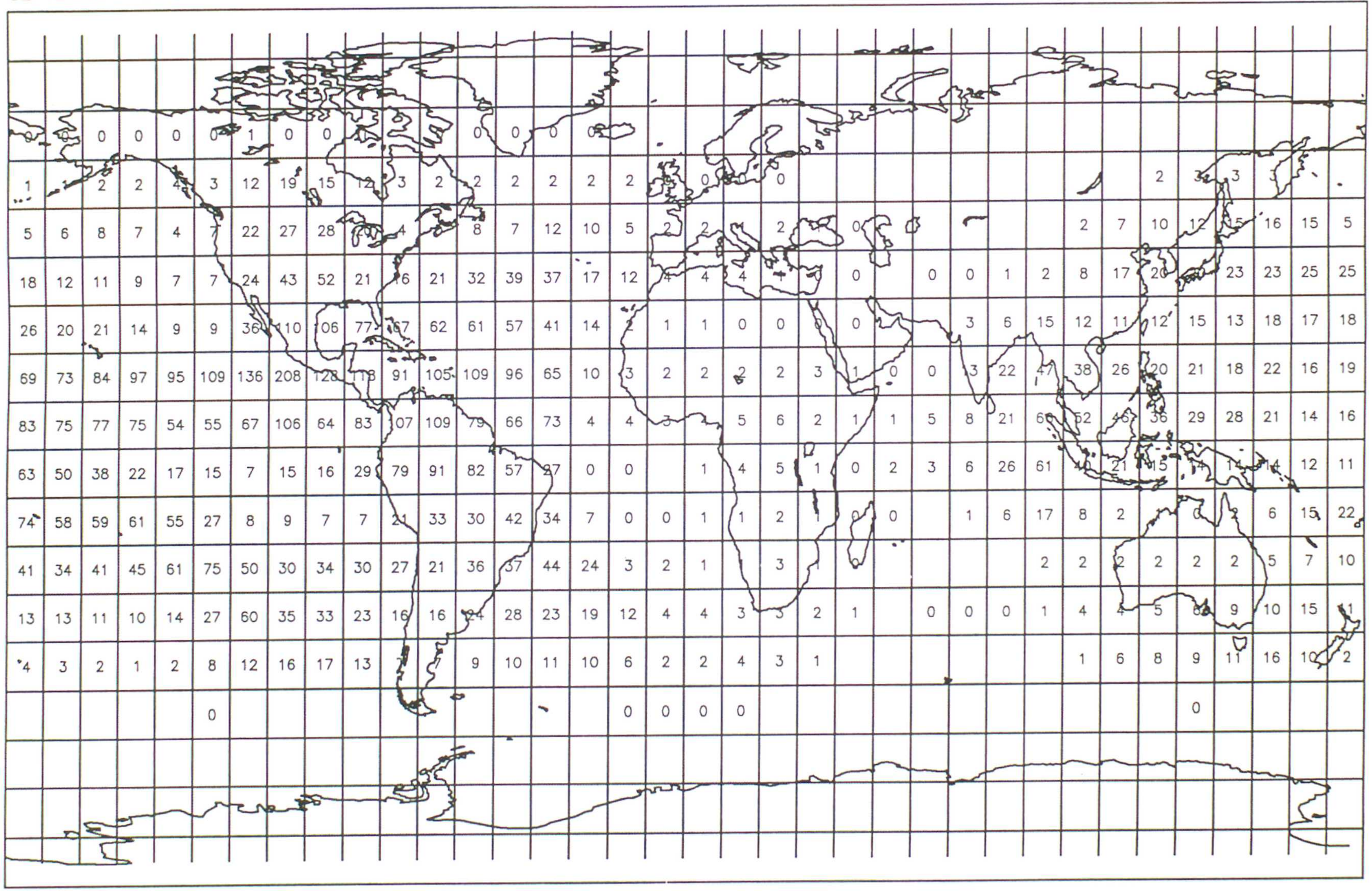
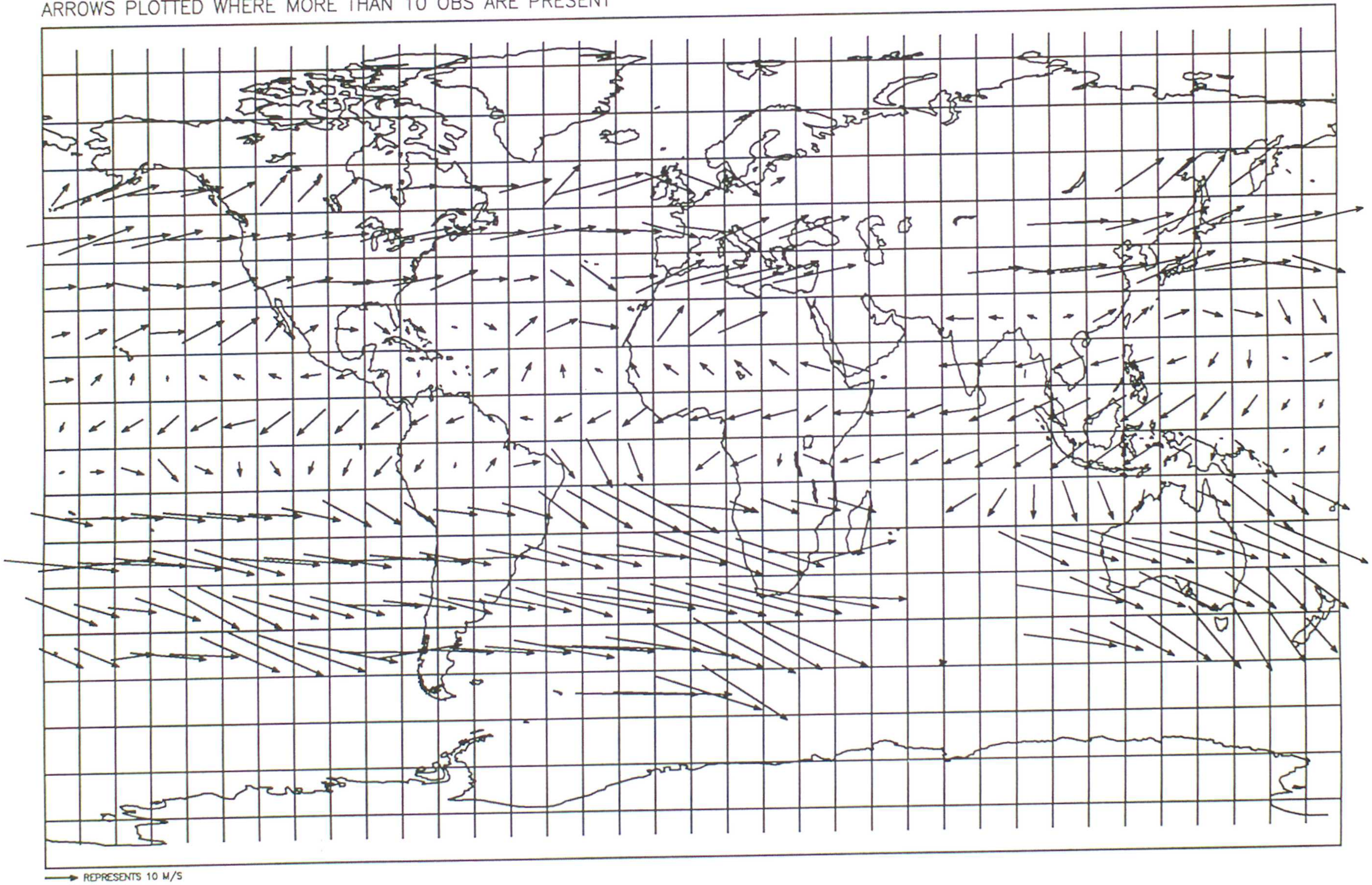

0 0 0 0 0 0 1 0 0 0 0 0 0
1 2 2 4 3 12 19 15 12 3 2 2 2 2 2 2 0 0 0 2 3 3 3
5 6 8 7 4 7 22 27 28 20 4 8 7 12 10 5 2 2 4 2 1 0 2 7 10 12 15 16 15 5
18 12 11 9 7 7 24 43 52 21 16 21 32 39 37 17 12 4 4 4 1 0 0 0 0 1 2 8 17 20 20 23 23 25 25
26 20 21 14 9 9 36 110 106 77 67 62 61 57 41 14 2 1 1 0 0 0 0 3 6 15 12 11 12 15 13 18 17 18
69 73 84 97 95 109 136 208 128 118 91 105 109 96 65 10 3 2 2 2 2 3 1 0 0 3 22 47 38 26 20 21 18 22 16 19
83 75 77 75 54 55 67 106 64 83 107 109 79 66 73 4 4 3 4 5 6 2 1 1 5 8 21 68 52 46 36 29 28 21 14 16
63 50 38 22 17 15 7 15 16 29 79 91 82 57 27 0 0 1 4 5 1 0 2 3 6 26 61 40 21 15 14 14 14 12 11
74 58 59 61 55 27 8 9 7 7 21 33 30 42 34 7 0 0 1 1 2 1 0 0 1 6 17 8 2 1 0 2 6 15 22
41 34 41 45 61 75 50 30 34 30 27 21 36 37 44 24 3 2 1 1 3 1 2 2 2 2 2 2 5 7 10
13 13 11 10 14 27 60 35 33 23 16 16 24 28 23 19 12 4 4 3 3 2 1 0 0 0 1 4 4 5 6 9 10 15 11
4 3 2 1 2 8 12 16 17 13 7 7 9 10 11 10 6 2 2 4 3 1 1 6 8 9 11 16 10 2
0 0 0 0 0 0

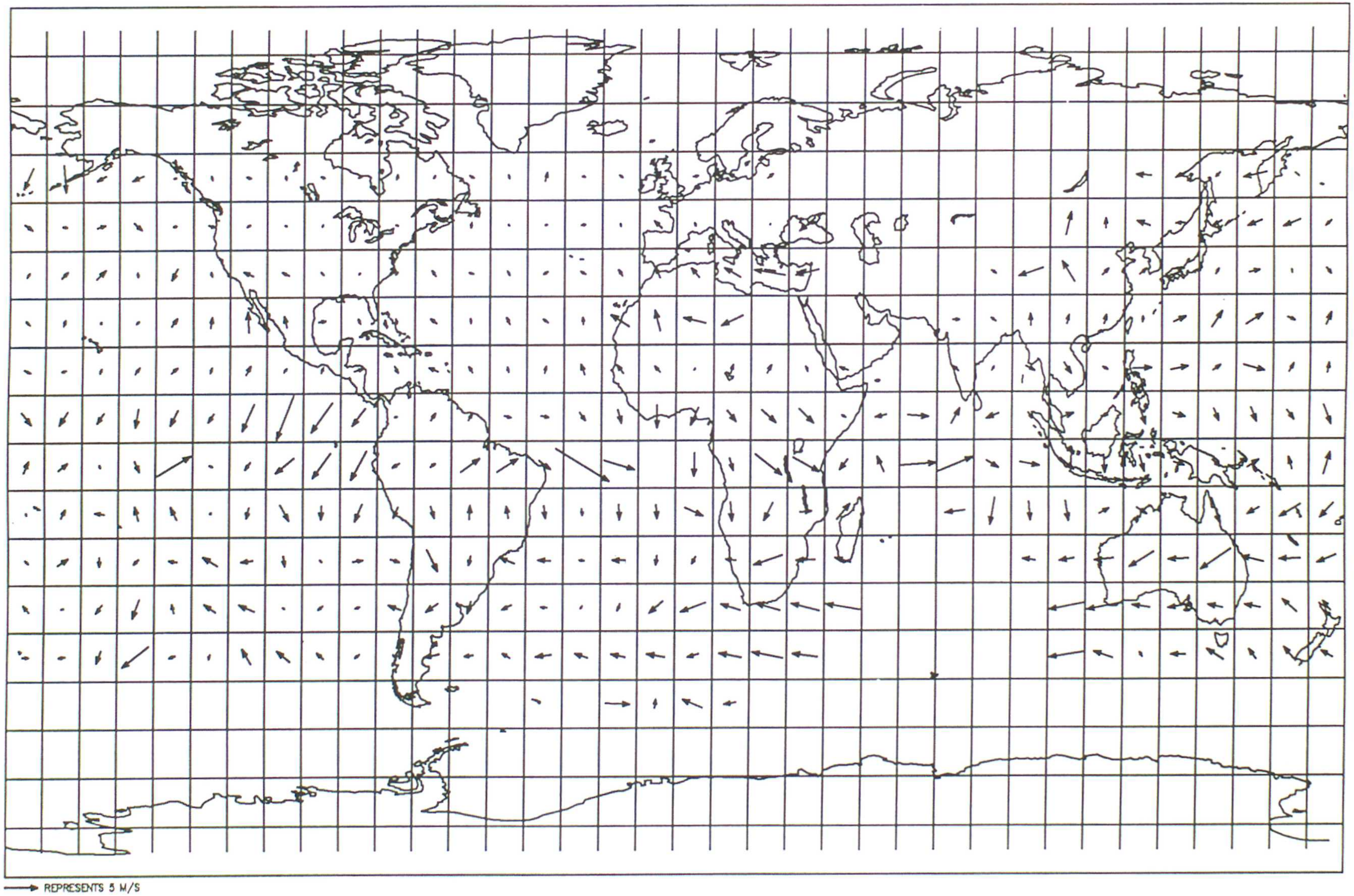
FIGURE 21

SATOB VECTOR MEAN WINDS BETWEEN 101–400 HPA
SEPTEMBER 1996
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

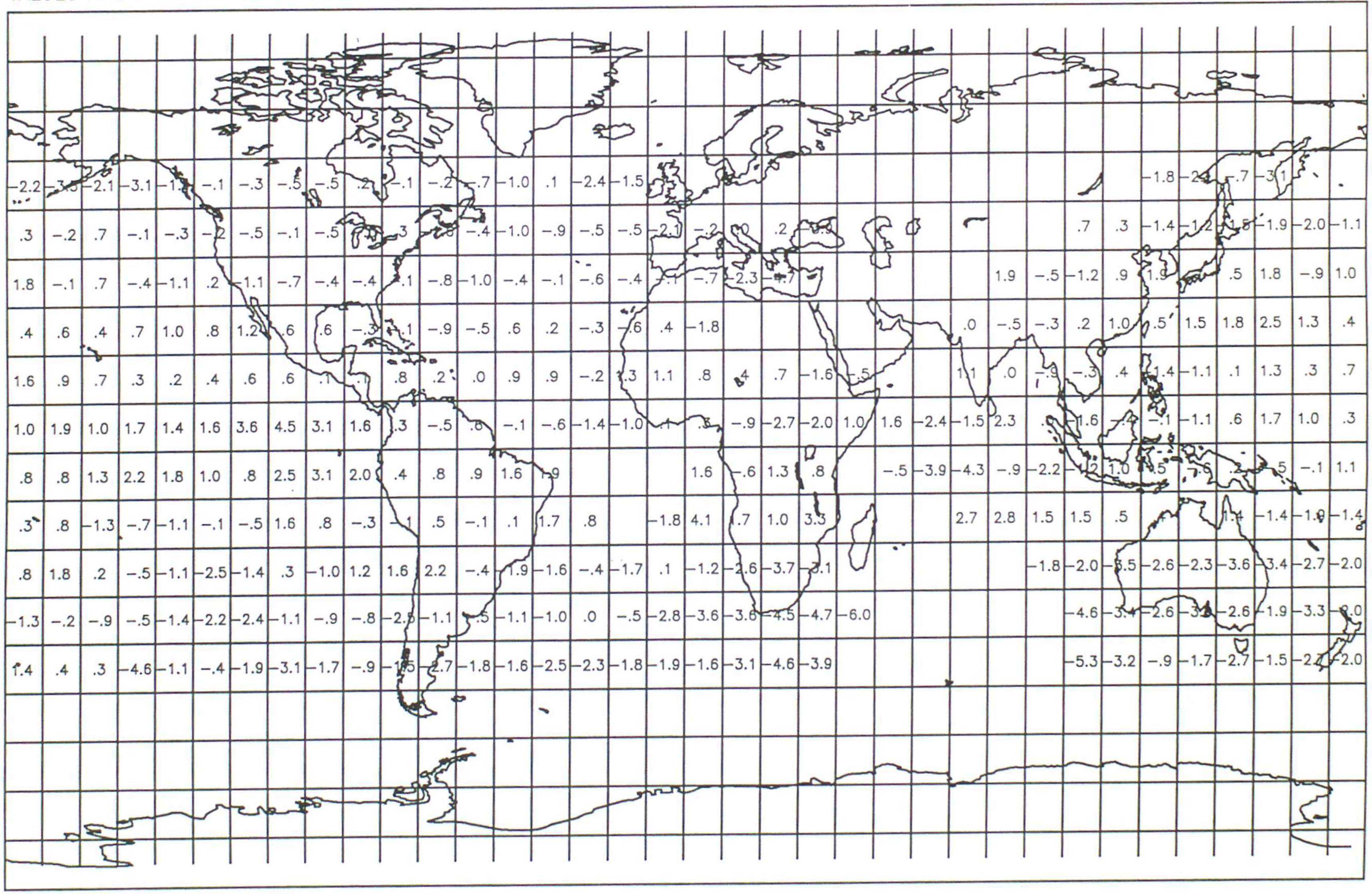

REPRESENTS 10 M/S

SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 101–400 HPA
SEPTEMBER 1996
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

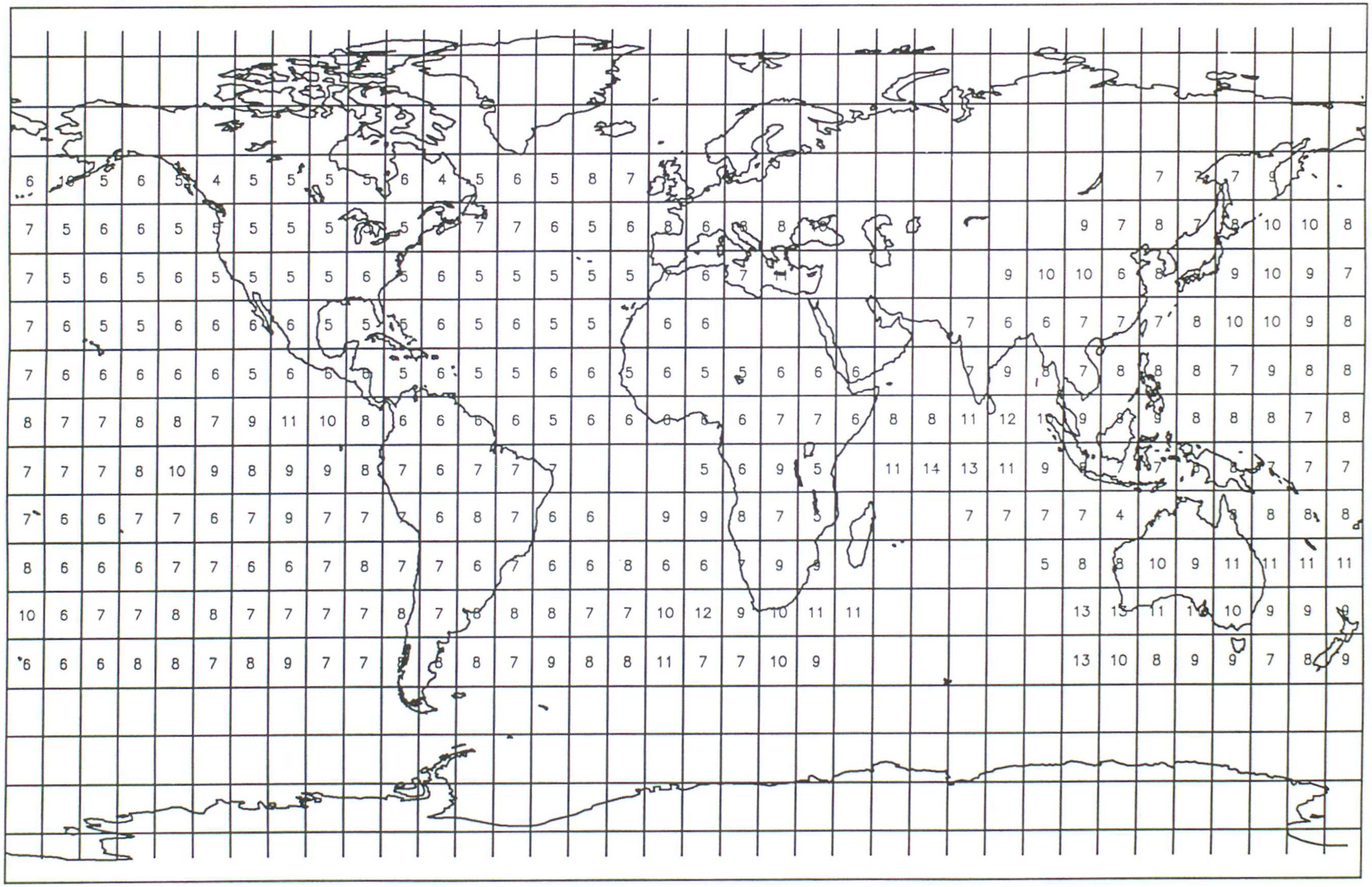
FIGURE 22



SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
SEPTEMBER 1996
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-2.2 -3.5 -2.1 -3.1 -1.2 -.1 -.3 -.5 -.5 .2 -.1 -.2 -.7 -1.0 .1 -2.4 -1.5 -1.8 -2.4 -.7 -3.1
.3 -.2 .7 -.1 -.3 -.2 -.5 -.1 -.5 .3 -.6 -.4 -1.0 -.9 -.5 -.5 -2.1 -.2 .0 .2 -3.3 .7 .3 -1.4 -1.2 -1.5 -1.9 -2.0 -1.1
1.8 -.1 .7 -.4 -1.1 .2 -1.1 -.7 -.4 -.4 .1 -.8 -1.0 -.4 -.1 -.6 -.4 .1 -.7 -2.3 -.7 1.9 -.5 -1.2 .9 1.9 .5 1.8 -.9 1.0
.4 .6 .4 .7 1.0 .8 1.2 .6 .6 -.3 .1 -.9 -.5 .6 .2 -.3 .6 .4 -1.8 .0 -.5 -.3 .2 1.0 .5 1.5 1.8 2.5 1.3 .4
1.6 .9 .7 .3 .2 .4 .6 .6 .1 .1 .8 .2 .0 .9 .9 -.2 .3 1.1 .8 .4 .7 -1.6 .5 1.1 .0 -.9 -.3 .4 -1.4 -1.1 .1 1.3 .3 .7
1.0 1.9 1.0 1.7 1.4 1.6 3.6 4.5 3.1 1.6 .3 -.5 .6 -.1 -.6 -1.4 -1.0 .1 .5 -.9 -2.7 -2.0 1.0 1.6 -2.4 -1.5 2.3 .1 -1.6 -.4 -.1 -1.1 .6 1.7 1.0 .3
.8 .8 1.3 2.2 1.8 1.0 .8 2.5 3.1 2.0 .4 .8 .9 1.6 1.9 1.6 -.6 1.3 .8 -.5 -3.9 -4.3 -.9 -2.2 -1.2 1.0 .5 .6 .2 .5 -.1 1.1
.3 .8 -1.3 -.7 -1.1 -.1 -.5 1.6 .8 -.3 -.1 .5 -.1 .1 1.7 .8 -1.8 4.1 .7 1.0 3.3 2.7 2.8 1.5 1.5 .5 1.4 -1.4 -1.0 -1.4
.8 1.8 .2 -.5 -1.1 -2.5 -1.4 .3 -1.0 1.2 1.6 2.2 -.4 -1.9 -1.6 -.4 -1.7 .1 -1.2 -2.6 -3.7 -3.1 -1.8 -2.0 -3.5 -2.6 -2.3 -3.6 -3.4 -2.7 -2.0
-1.3 -.2 -.9 -.5 -1.4 -2.2 -2.4 -1.1 -.9 -.8 -2.3 -1.1 -.5 -1.1 -1.0 .0 -.5 -2.8 -3.6 -3.6 -4.5 -4.7 -6.0 -4.6 -3.4 -2.6 -3.3 -2.6 -1.9 -3.3 -3.0
1.4 .4 .3 -4.6 -1.1 -.4 -1.9 -3.1 -1.7 -.9 -1.5 -2.7 -1.8 -1.6 -2.5 -2.3 -1.8 -1.9 -1.6 -3.1 -4.6 -3.9 -5.3 -3.2 -.9 -1.7 -2.7 -1.5 -2.2 -2.0

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
SEPTEMBER 1996
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


6 10 5 6 5 4 5 5 5 5 6 4 5 6 5 8 7 7 7 7 7 9
7 5 6 6 5 5 5 5 5 5 5 7 7 6 5 6 8 6 8 8 10 9 7 8 7 8 10 10 8
7 5 6 5 6 5 5 5 5 6 5 6 5 5 5 5 5 7 6 7 11 9 10 10 6 8 9 10 9 7
7 6 5 5 6 6 6 6 5 5 5 6 5 6 5 5 7 6 6 7 6 6 7 7 7 8 10 10 9 8
7 6 6 6 6 6 5 6 6 6 5 6 5 5 6 6 5 6 5 5 6 6 6 7 9 8 7 8 8 8 7 9 8 8
8 7 7 8 8 7 9 11 10 8 6 6 6 6 5 6 6 6 6 6 7 7 6 8 8 11 12 10 9 8 9 8 8 8 7 8
7 7 7 8 10 9 8 9 9 8 7 6 7 7 7 5 6 9 5 11 14 13 11 9 8 7 7 8 8 7 7 7
7 6 6 7 7 6 7 9 7 7 7 6 8 7 6 6 9 9 8 7 5 7 7 7 7 4 4 8 8 8 8
8 6 6 6 7 7 6 6 7 8 7 7 6 7 6 6 8 6 6 7 9 9 5 8 8 10 9 11 11 11 11
10 6 7 7 8 8 7 7 7 7 8 7 8 8 8 7 7 10 12 9 10 11 11 13 13 11 10 10 9 9 9
6 6 6 8 8 7 8 9 7 7 8 8 8 7 9 8 8 11 7 7 10 9 13 10 8 9 9 7 8 9

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: September, 1996

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-12, NOAA-14 500 km.

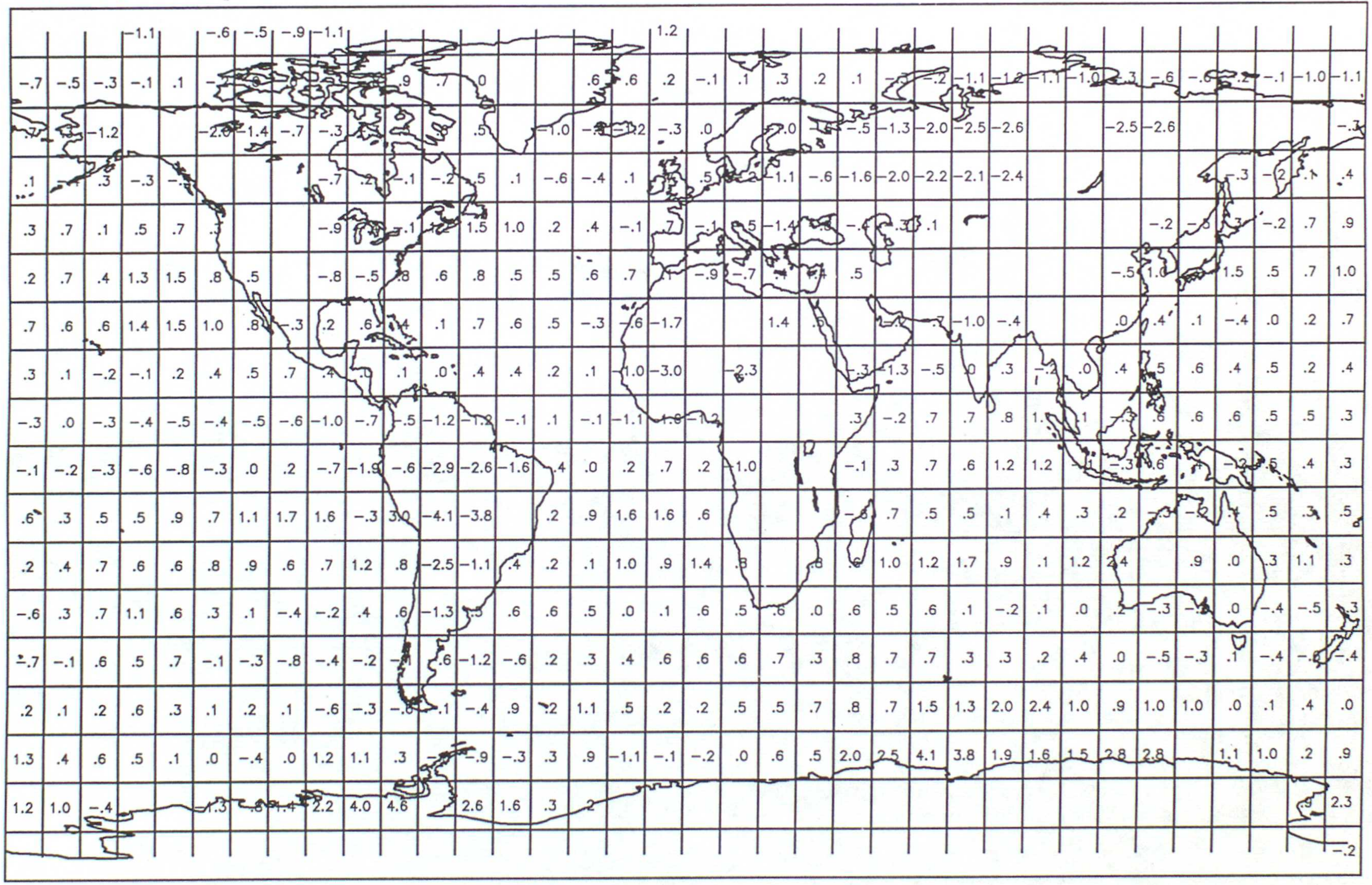
Standard of comparison :Background field from Bracknell global model.

Selection Criteria :All SATEM soundings where number of observations > 30.

Data Extracted :Layer: 850 - 1000 hPa
100 - 300 hPa
30 - 50 hPa

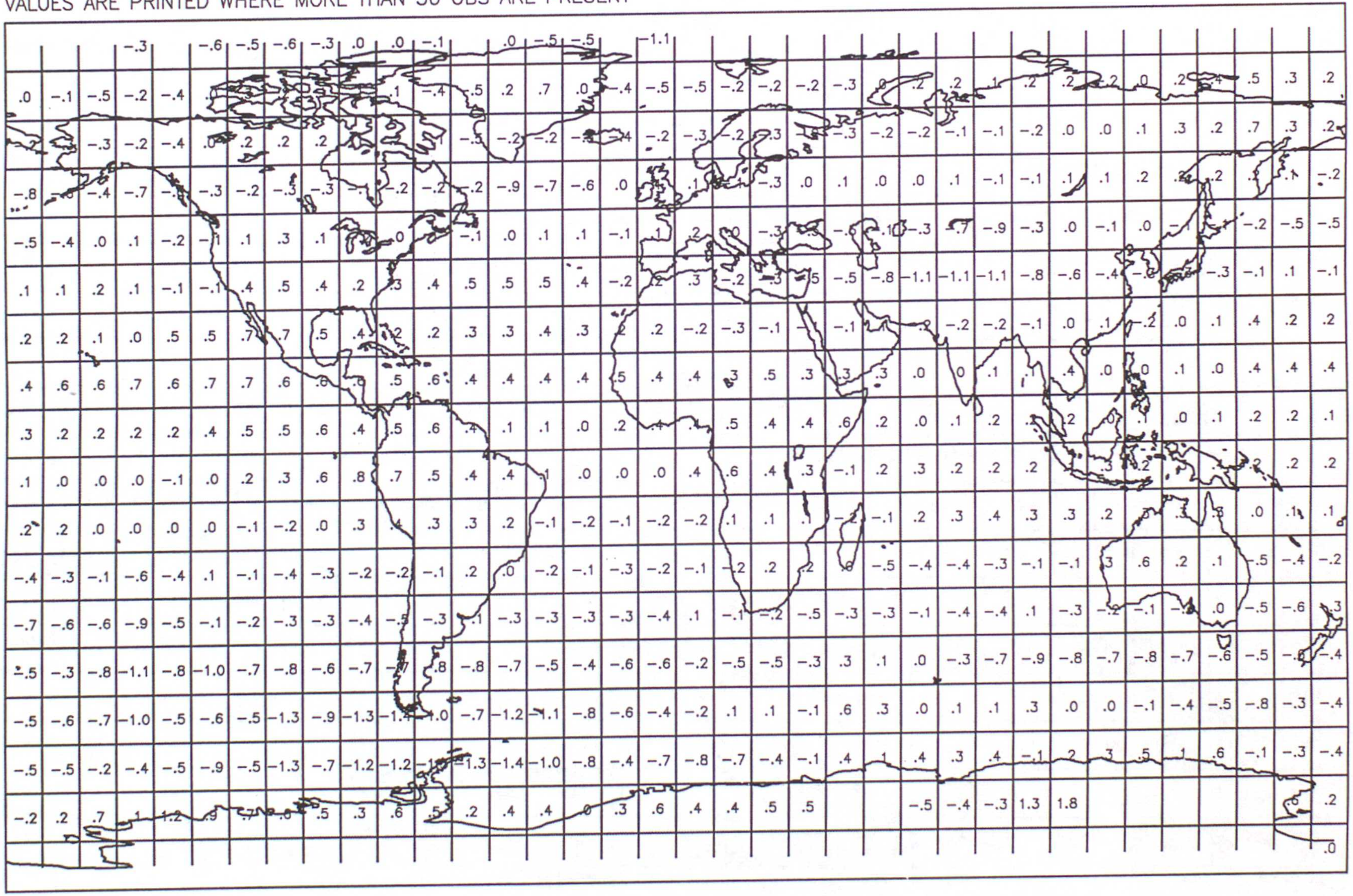
:Mean observation minus background temperature differences

500 KM SATEMS : MEAN O–B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
SEPTEMBER 1996
FIGURE 25
NOAA–12, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

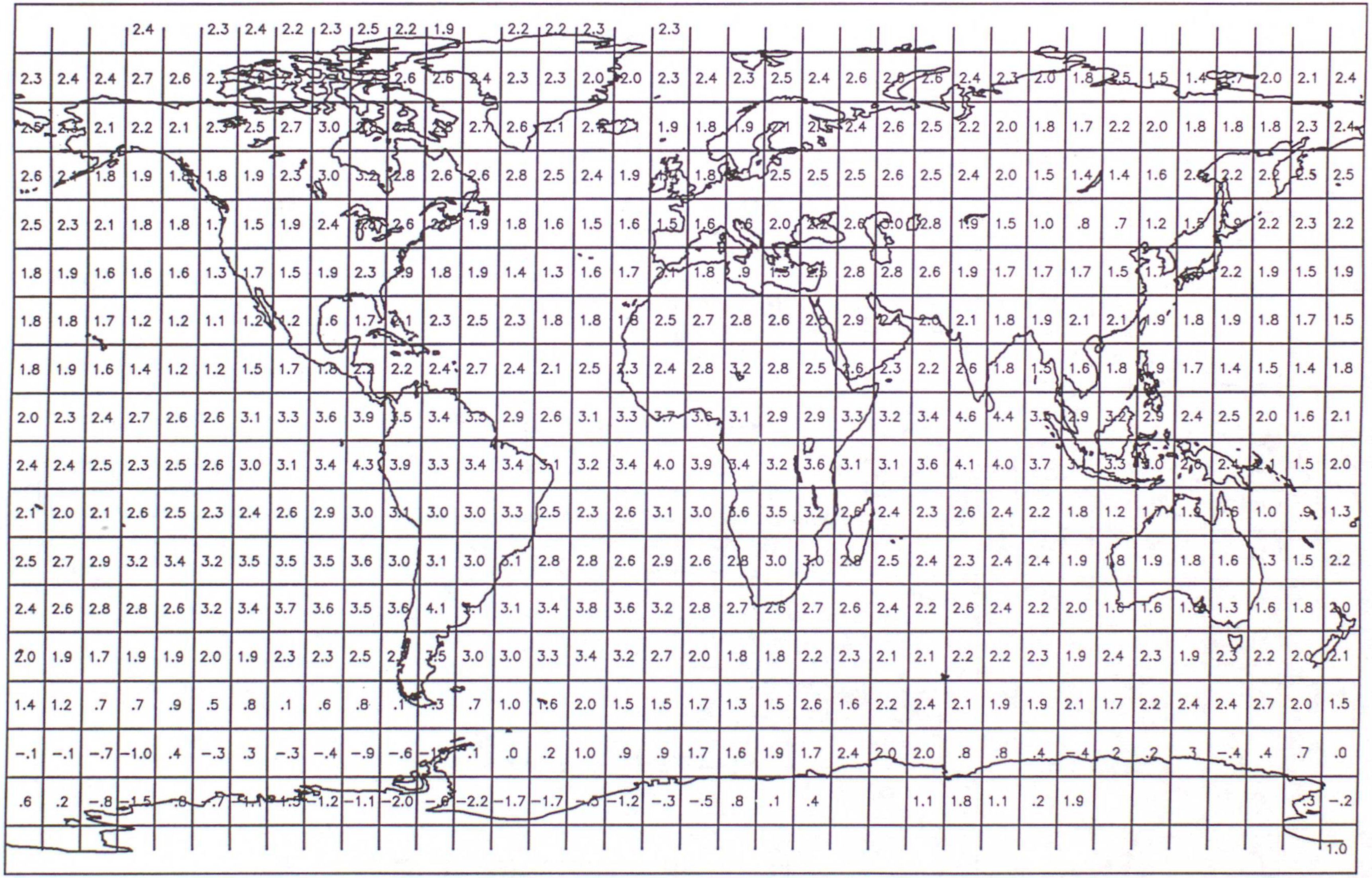


500 KM SATEMS : MEAN O–B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA
SEPTEMBER 1996
NOAA–12, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 26

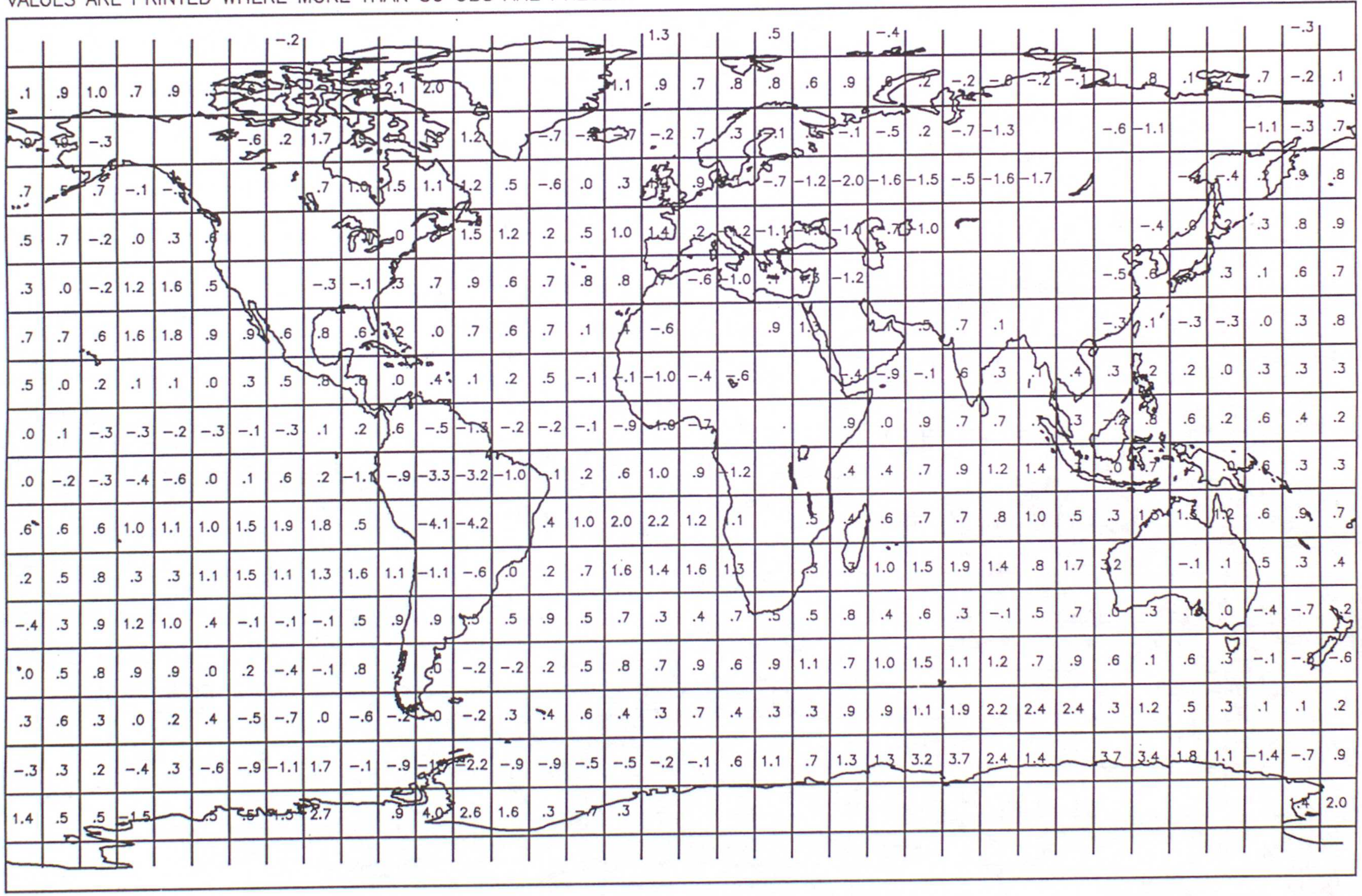


500 KM SATEMS : MEAN O−B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
SEPTEMBER 1996 FIGURE 27
NOAA−12, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT


2.4 2.3 2.4 2.2 2.3 2.5 2.2 1.9 2.2 2.2 2.3 2.3
2.3 2.4 2.4 2.7 2.6 2.3 [illegible] 2.5 [illegible] [illegible] 2.6 2.6 2.4 2.3 2.3 2.0 2.0 2.3 2.4 2.3 2.5 2.4 2.6 2.8 2.6 2.4 2.3 2.0 1.8 2.5 1.5 1.4 2.7 2.0 2.1 2.4
2.5 2.3 2.1 2.2 2.1 2.3 2.5 2.7 3.0 [illegible] [illegible] [illegible] 2.7 2.6 2.1 [illegible] 2.1 1.9 1.8 1.9 2.1 2.5 2.4 2.6 2.5 2.2 2.0 1.8 1.7 2.2 2.0 1.8 1.8 1.8 2.3 2.4
2.6 2.1 1.8 1.9 1.8 1.8 1.9 2.3 3.0 3.2 2.8 2.6 2.6 2.8 2.5 2.4 1.9 1.4 1.8 [illegible] 2.5 2.5 2.5 2.6 2.5 2.4 2.0 1.5 1.4 1.4 1.6 2.6 2.2 2.2 2.5 2.5
2.5 2.3 2.1 1.8 1.8 1.7 1.5 1.9 2.4 [illegible] 2.6 [illegible] 1.9 1.8 1.6 1.5 1.6 1.5 1.6 1.6 2.0 2.2 2.6 3.0 2.8 1.9 1.5 1.0 .8 .7 1.2 1.5 1.9 2.2 2.3 2.2
1.8 1.9 1.6 1.6 1.6 1.3 1.7 1.5 1.9 2.3 1.9 1.8 1.9 1.4 1.3 1.6 1.7 2.1 1.8 .9 1.5 2.5 2.8 2.8 2.6 1.9 1.7 1.7 1.7 1.5 1.7 [illegible] 2.2 1.9 1.5 1.9
1.8 1.8 1.7 1.2 1.2 1.1 1.2 1.2 .6 1.7 2.1 2.3 2.5 2.3 1.8 1.8 1.8 2.5 2.7 2.8 2.6 2.5 2.9 2.4 2.0 2.1 1.8 1.9 2.1 2.1 1.9 1.8 1.9 1.8 1.7 1.5
1.8 1.9 1.6 1.4 1.2 1.2 1.5 1.7 1.8 2.2 2.2 2.4 2.7 2.4 2.1 2.5 2.3 2.4 2.8 3.2 2.8 2.5 3.6 2.3 2.2 2.6 1.8 1.5 1.6 1.8 1.9 1.7 1.4 1.5 1.4 1.8
2.0 2.3 2.4 2.7 2.6 2.6 3.1 3.3 3.6 3.9 3.5 3.4 3.5 2.9 2.6 3.1 3.3 3.7 3.6 3.1 2.9 2.9 3.3 3.2 3.4 4.6 4.4 3.5 2.9 3.2 2.9 2.4 2.5 2.0 1.6 2.1
2.4 2.4 2.5 2.3 2.5 2.6 3.0 3.1 3.4 4.3 3.9 3.3 3.4 3.4 3.1 3.2 3.4 4.0 3.9 3.4 3.2 3.6 3.1 3.1 3.6 4.1 4.0 3.7 [illegible] 3.3 3.0 2.6 2.4 2.1 1.5 2.0
2.1 2.0 2.1 2.6 2.5 2.3 2.4 2.6 2.9 3.0 3.1 3.0 3.0 3.3 2.5 2.3 2.6 3.1 3.0 3.6 3.5 3.2 2.6 2.4 2.3 2.6 2.4 2.2 1.8 1.2 1.7 1.5 1.6 1.0 .9 1.3
2.5 2.7 2.9 3.2 3.4 3.2 3.5 3.5 3.5 3.6 3.0 3.1 3.0 3.1 2.8 2.8 2.6 2.9 2.6 2.8 3.0 3.0 2.8 2.5 2.4 2.3 2.4 2.4 1.9 1.8 1.9 1.8 1.6 1.3 1.5 2.2
2.4 2.6 2.8 2.8 2.6 3.2 3.4 3.7 3.6 3.5 3.6 4.1 3.1 3.1 3.4 3.8 3.6 3.2 2.8 2.7 2.6 2.7 2.6 2.4 2.2 2.6 2.4 2.2 2.0 1.6 1.6 1.6 1.3 1.6 1.8 2.0
2.0 1.9 1.7 1.9 1.9 2.0 1.9 2.3 2.3 2.5 [illegible] 3.5 3.0 3.0 3.3 3.4 3.2 2.7 2.0 1.8 1.8 2.2 2.3 2.1 2.1 2.2 2.2 2.3 1.9 2.4 2.3 1.9 2.3 2.2 2.0 2.1
1.4 1.2 .7 .7 .9 .5 .8 .1 .6 .8 .1 .3 .7 1.0 1.6 2.0 1.5 1.5 1.7 1.3 1.5 2.6 1.6 2.2 2.4 2.1 1.9 1.9 2.1 1.7 2.2 2.4 2.4 2.7 2.0 1.5
−.1 −.1 −.7 −1.0 .4 −.3 .3 −.3 −.4 −.9 −.6 [illegible] .1 .0 .2 1.0 .9 .9 1.7 1.6 1.9 1.7 2.4 2.0 2.0 .8 .8 .4 −.4 .2 .2 .3 −.4 .4 .7 .0
.6 .2 −.8 −1.5 .8 −.7 −1.1 −1.5 −1.2 −1.1 −2.0 −.6 −2.2 −1.7 −1.7 −.5 −1.2 −.3 −.5 .8 .1 .4 1.1 1.8 1.1 .2 1.9 .3 −.2
1.0

500 KM SATEMS : MEAN O−B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
SEPTEMBER 1996
NOAA−14, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 28


−.2 1.3 .5 −.4 −.3
.1 .9 1.0 .7 .9 2.1 2.0 1.1 .9 .7 .8 .8 .6 .9 .2 −.2 −.2 −.1 .8 .1 .7 −.2 .1
−.3 −.6 .2 1.7 1.2 −.7 −.2 .7 .3 −.1 −.5 .2 −.7 −1.3 −.6 −1.1 −1.1 −.3 .7
.7 .7 −.1 .7 1.5 1.1 1.2 .5 −.6 .0 .3 .9 −.7 −1.2 −2.0 −1.6 −1.5 −.5 −1.6 −1.7 −.4 .9 .8
.5 .7 −.2 .0 .3 1.5 1.2 .2 .5 1.0 1.4 .2 −1.1 −1.0 −1.0 −.4 .3 .8 .9
.3 .0 −.2 1.2 1.6 .5 −.3 −.1 .7 .9 .6 .7 .8 .8 −.6 −1.0 −1.2 −.5 .3 .1 .6 .7
.7 .7 .6 1.6 1.8 .9 .9 .6 .8 .6 .0 .7 .6 .7 .1 −.6 .9 .7 .1 .1 −.3 −.3 .0 .3 .8
.5 .0 .2 .1 .1 .0 .3 .5 .0 .4 .1 .2 .5 −.1 −.1 −1.0 −.4 .6 −.4 −.9 −.1 .6 .3 .4 .3 .2 .2 .0 .3 .3 .3
.0 .1 −.3 −.3 −.2 −.3 −.1 −.3 .1 .2 .6 −.5 −1.3 −.2 −.2 −.1 −.9 −1.0 .9 .0 .9 .7 .7 .3 .8 .6 .2 .6 .4 .2
.0 −.2 −.3 −.4 −.6 .0 .1 .6 .2 −1.1 −.9 −3.3 −3.2 −1.0 .1 .2 .6 1.0 .9 1.2 .4 .4 .7 .9 1.2 1.4 .0 .7 .6 .3 .3
.6 .6 .6 1.0 1.1 1.0 1.5 1.9 1.8 .5 −4.1 −4.2 .4 1.0 2.0 2.2 1.2 .1 .5 .4 .6 .7 .7 .8 1.0 .5 .3 1.3 1.5 1.2 .6 .9 .7
.2 .5 .8 .3 .3 1.1 1.5 1.1 1.3 1.6 1.1 −1.1 −.6 .0 .2 .7 1.6 1.4 1.6 1.3 .3 .3 1.0 1.5 1.9 1.4 .8 1.7 3.2 −.1 .1 .5 .3 .4
−.4 .3 .9 1.2 1.0 .4 −.1 −.1 −.1 .5 .9 .9 .5 .5 .9 .5 .7 .3 .4 .7 .5 .5 .8 .4 .6 .3 −.1 .5 .7 .0 .3 .1 .0 −.4 −.7 .2
.0 .5 .8 .9 .9 .0 .2 −.4 −.1 .8 .0 −.2 −.2 .2 .5 .8 .7 .9 .6 .9 1.1 .7 1.0 1.5 1.1 1.2 .7 .9 .6 .1 .6 .3 −.1 −.8 −.6
.3 .6 .3 .0 .2 .4 −.5 −.7 .0 −.6 −.2 .0 −.2 .3 .4 .6 .4 .3 .7 .4 .3 .3 .9 .9 1.1 1.9 2.2 2.4 2.4 .3 1.2 .5 .3 .1 .1 .2
−.3 .3 .2 −.4 .3 −.6 −.9 −1.1 1.7 −.1 −.9 −1.1 −2.2 −.9 −.9 −.5 −.5 −.2 −.1 .6 1.1 .7 1.3 1.3 3.2 3.7 2.4 1.4 3.7 3.4 1.8 1.1 −1.4 −.7 .9
1.4 .5 .5 −1.5 .5 .5 1.5 2.7 .9 4.0 2.6 1.6 .3 −.7 .3 .4 2.0

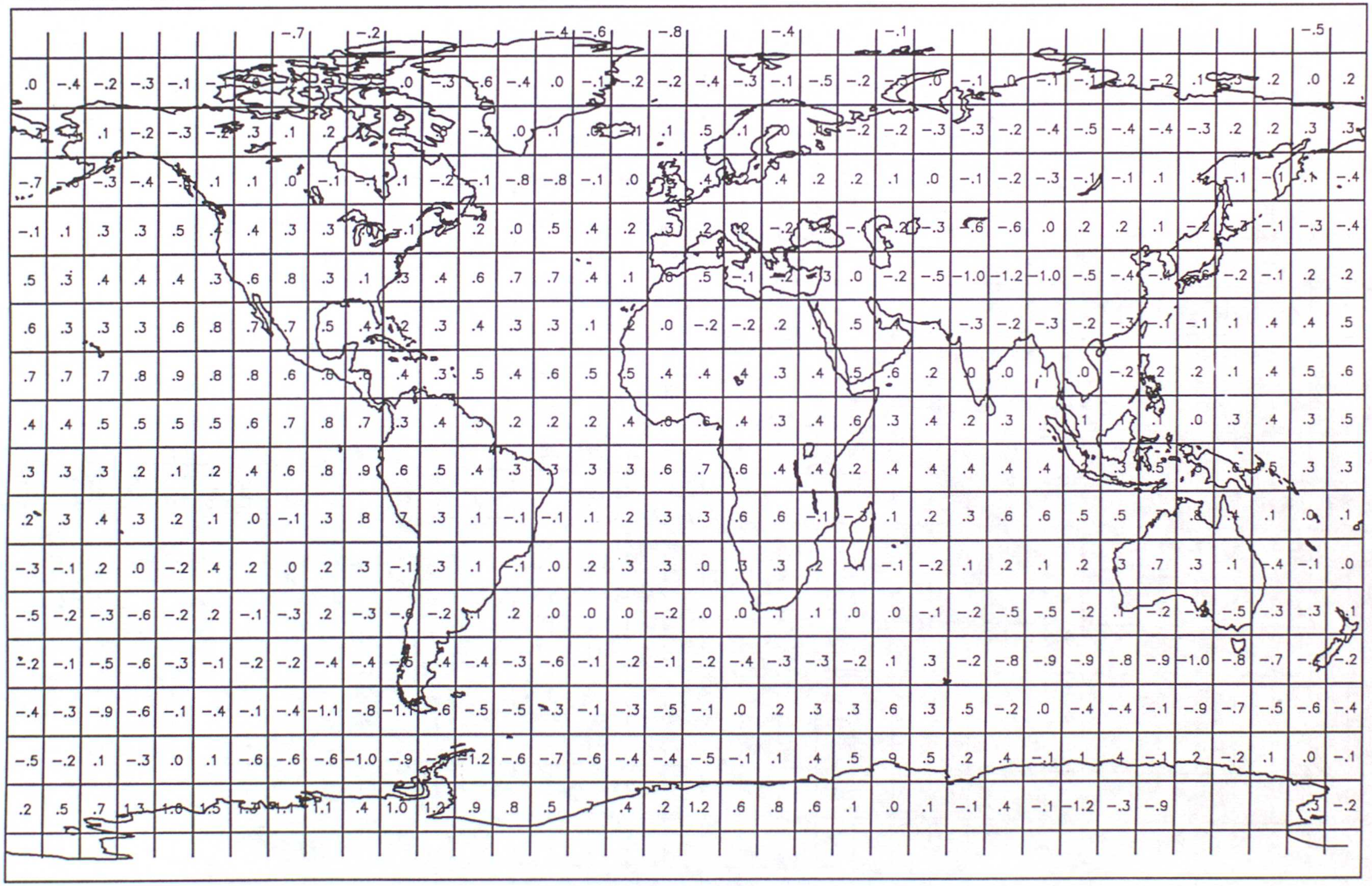
500 KM SATEMS : MEAN O–B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA

SEPTEMBER 1996

FIGURE 29

NOAA–14, USING ALL OBSERVATIONS

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



500 KM SATEMS : MEAN O–B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
SEPTEMBER 1996
NOAA–14, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 30

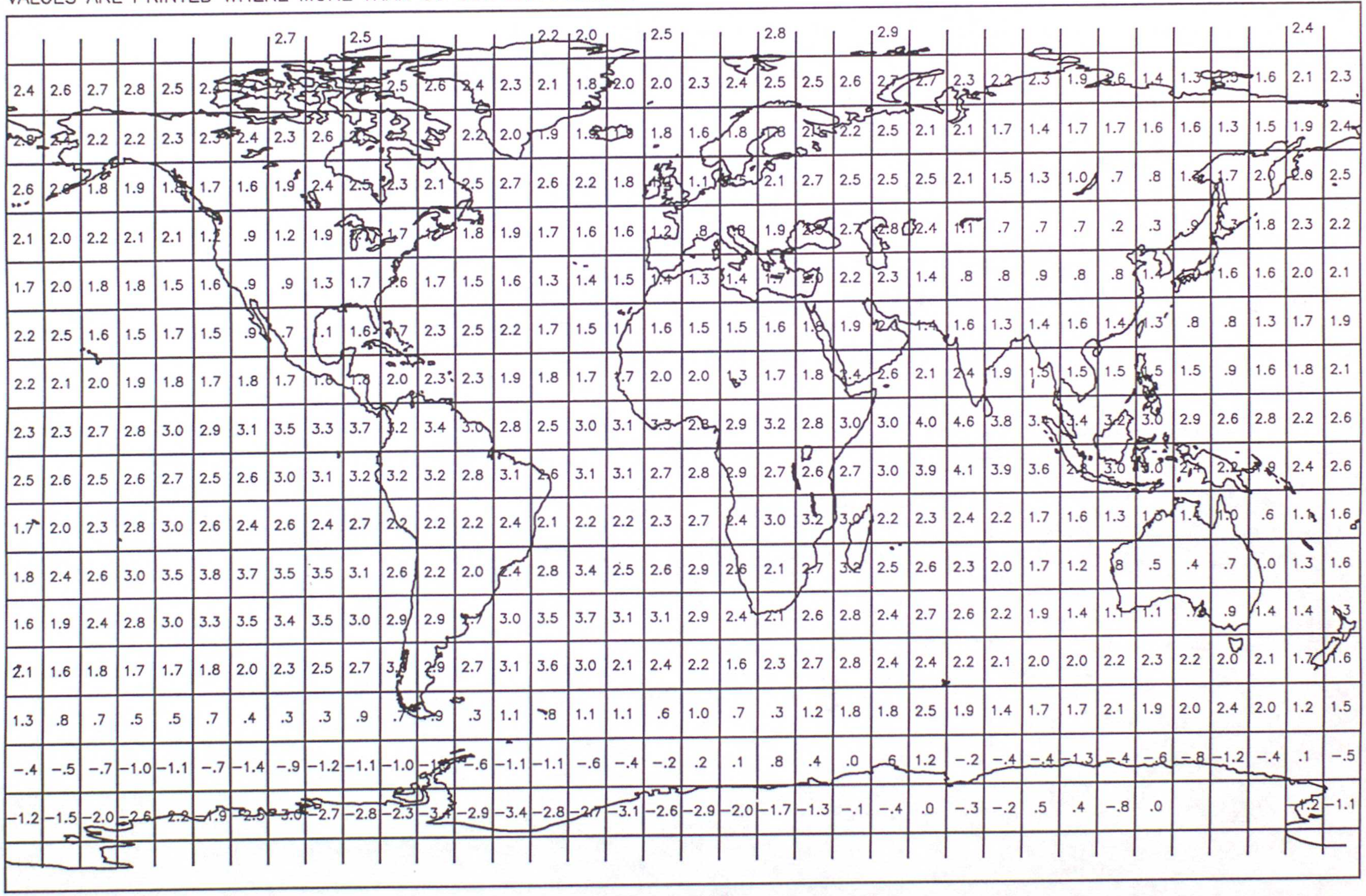

2.7 2.5 2.2 2.0 2.5 2.8 2.9 2.4
2.4 2.6 2.7 2.8 2.5 2.4 2.5 2.6 2.4 2.3 2.1 1.8 2.0 2.0 2.3 2.4 2.5 2.5 2.6 2.7 2.7 2.3 2.2 2.3 1.9 2.6 1.4 1.3 1.6 2.1 2.3
2.8 2.4 2.2 2.2 2.3 2.3 2.4 2.3 2.6 2.2 2.0 1.9 1.8 1.6 1.8 1.8 2.1 2.2 2.5 2.1 2.1 1.7 1.4 1.7 1.7 1.6 1.6 1.3 1.5 1.9 2.4
2.6 2.8 1.8 1.9 1.8 1.7 1.6 1.9 2.4 2.5 2.3 2.1 2.5 2.7 2.6 2.2 1.8 1.1 2.1 2.7 2.5 2.5 2.5 2.1 1.5 1.3 1.0 .7 .8 1.4 1.7 2.0 2.8 2.5
2.1 2.0 2.2 2.1 2.1 1.2 .9 1.2 1.9 1.7 1.8 1.9 1.7 1.6 1.6 1.2 .8 1.9 2.7 2.8 2.4 1.1 .7 .7 .7 .2 .3 .9 1.8 2.3 2.2
1.7 2.0 1.8 1.8 1.5 1.6 .9 .9 1.3 1.7 1.6 1.7 1.5 1.6 1.3 1.4 1.5 1.4 1.3 1.4 1.7 2.0 2.2 2.3 1.4 .8 .8 .9 .8 .8 1.4 1.6 1.6 2.0 2.1
2.2 2.5 1.6 1.5 1.7 1.5 .9 .7 .1 1.6 1.7 2.3 2.5 2.2 1.7 1.5 1.1 1.6 1.5 1.5 1.6 1.9 1.9 2.0 1.4 1.6 1.3 1.4 1.6 1.4 1.3 .8 .8 1.3 1.7 1.9
2.2 2.1 2.0 1.9 1.8 1.7 1.8 1.7 1.6 1.8 2.0 2.3 2.3 1.9 1.8 1.7 1.7 2.0 2.0 1.3 1.7 1.8 2.4 2.6 2.1 2.4 1.9 1.5 1.5 1.5 1.5 1.5 .9 1.6 1.8 2.1
2.3 2.3 2.7 2.8 3.0 2.9 3.1 3.5 3.3 3.7 3.2 3.4 3.0 2.8 2.5 3.0 3.1 3.3 2.8 2.9 3.2 2.8 3.0 3.0 4.0 4.6 3.8 3.5 3.4 3.2 3.0 2.9 2.6 2.8 2.2 2.6
2.5 2.6 2.5 2.6 2.7 2.5 2.6 3.0 3.1 3.2 3.2 3.2 2.8 3.1 2.6 3.1 3.1 2.7 2.8 2.9 2.7 2.6 2.7 3.0 3.9 4.1 3.9 3.6 2.8 3.0 3.0 2.4 2.2 1.9 2.4 2.6
1.7 2.0 2.3 2.8 3.0 2.6 2.4 2.6 2.4 2.7 2.2 2.2 2.2 2.4 2.1 2.2 2.2 2.3 2.7 2.4 3.0 3.2 3.0 2.2 2.3 2.4 2.2 1.7 1.6 1.3 1.3 1.4 1.0 .6 1.1 1.6
1.8 2.4 2.6 3.0 3.5 3.8 3.7 3.5 3.5 3.1 2.6 2.2 2.0 2.4 2.8 3.4 2.5 2.6 2.9 2.6 2.1 2.7 3.2 2.5 2.6 2.3 2.0 1.7 1.2 .8 .5 .4 .7 1.0 1.3 1.6
1.6 1.9 2.4 2.8 3.0 3.3 3.5 3.4 3.5 3.0 2.9 2.9 2.7 3.0 3.5 3.7 3.1 3.1 2.9 2.4 2.1 2.6 2.8 2.4 2.7 2.6 2.2 1.9 1.4 1.1 1.1 .7 .9 1.4 1.4 1.3
2.1 1.6 1.8 1.7 1.7 1.8 2.0 2.3 2.5 2.7 3.3 2.9 2.7 3.1 3.6 3.0 2.1 2.4 2.2 1.6 2.3 2.7 2.8 2.4 2.4 2.2 2.1 2.0 2.0 2.2 2.3 2.2 2.0 2.1 1.7 1.6
1.3 .8 .7 .5 .5 .7 .4 .3 .3 .9 .7 .9 .3 1.1 .8 1.1 1.1 .6 1.0 .7 .3 1.2 1.8 1.8 2.5 1.9 1.4 1.7 1.7 2.1 1.9 2.0 2.4 2.0 1.2 1.5
-.4 -.5 -.7 -1.0 -1.1 -.7 -1.4 -.9 -1.2 -1.1 -1.0 -.6 -1.1 -1.1 -.6 -.4 -.2 .2 .1 .8 .4 .0 .6 1.2 -.2 -.4 -.4 -1.3 -.4 -.6 -.8 -1.2 -.4 .1 -.5
-1.2 -1.5 -2.0 -2.6 -2.2 -1.9 -2.5 -3.0 -2.7 -2.8 -2.3 -3.4 -2.9 -3.4 -2.8 -2.7 -3.1 -2.6 -2.9 -2.0 -1.7 -1.3 -.1 -.4 .0 -.3 -.2 .5 .4 -.8 .0 -1.2 -1.1

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13903	20.4	-33.7	ALL	MSLP	SUR	194	0	0	0.9	0.0	0.9
13905	19.4	-37.8	ALL	MSLP	SUR	201	0	0	0.9	-0.2	0.9
13910	16.2	-39.2	ALL	MSLP	SUR	216	0	0	1.0	0.1	1.0
13911	16.5	-47.9	ALL	MSLP	SUR	199	0	0	1.1	0.4	1.2
13912	17.3	-50.6	ALL	MSLP	SUR	215	0	0	1.1	0.6	1.2
13913	16.7	-33.4	ALL	MSLP	SUR	213	0	0	0.8	0.1	0.8
13915	12.6	-31.8	ALL	MSLP	SUR	201	0	0	1.1	-0.1	1.1
20806	29.8	-64.0	ALL	MSLP	SUR	1	0	0	0.0	1.2	1.2
25565	60.6	-10.8	ALL	MSLP	SUR	541	0	0	1.2	-0.2	1.2
41504	31.8	-57.3	ALL	MSLP	SUR	1	0	0	0.0	0.0	0.0
41526	34.3	-60.3	ALL	MSLP	SUR	2	0	0	0.0	0.0	0.0
41527	30.7	-77.5	ALL	MSLP	SUR	155	0	0	0.9	0.2	1.0
41529	30.8	-77.4	ALL	MSLP	SUR	157	0	0	1.0	0.4	1.0
41530	35.3	-73.4	ALL	MSLP	SUR	166	0	0	1.0	0.3	1.0
41611	12.7	-43.7	ALL	MSLP	SUR	273	0	0	0.9	-0.1	0.9
41612	11.7	-44.2	ALL	MSLP	SUR	295	0	0	0.8	0.1	0.8
41613	16.5	-45.0	ALL	MSLP	SUR	303	0	0	0.9	0.0	0.9
41614	13.7	-43.0	ALL	MSLP	SUR	284	0	0	0.9	0.1	0.9
41922	23.1	-45.2	ALL	MSLP	SUR	217	0	0	1.0	0.9	1.3
41924	11.2	-46.1	ALL	MSLP	SUR	209	0	0	1.1	0.4	1.1
42531	30.6	-77.5	ALL	MSLP	SUR	111	8	7	2.9	0.1	2.9
42532	30.7	-77.5	ALL	MSLP	SUR	123	10	8	3.1	0.0	3.1
42533	33.1	-76.0	ALL	MSLP	SUR	121	0	0	3.2	-0.4	3.2
44513	56.2	-54.3	ALL	MSLP	SUR	374	0	0	1.1	-0.7	1.3
44606	63.0	-8.6	ALL	MSLP	SUR	1	0	0	0.0	1.6	1.6
44614	61.1	-22.3	ALL	MSLP	SUR	1435	3	0	1.1	-0.2	1.1
44616	62.8	-9.3	ALL	MSLP	SUR	1730	1	0	1.0	0.7	1.2
44617	49.0	-41.5	ALL	MSLP	SUR	368	2	1	1.5	-0.3	1.5
44727	34.1	-17.3	ALL	MSLP	SUR	702	2	0	0.8	-0.3	0.8
44743	52.1	-49.3	ALL	MSLP	SUR	376	2	1	1.7	-0.3	1.7
44760	23.8	-56.8	ALL	MSLP	SUR	291	0	0	0.8	0.1	0.8
44763	60.0	-24.9	ALL	MSLP	SUR	1782	1	0	1.1	0.1	1.1
44765	60.5	-16.0	ALL	MSLP	SUR	1579	1	0	1.1	-0.3	1.1
44766	51.0	-38.4	ALL	MSLP	SUR	502	0	0	1.6	-0.6	1.7
44767	59.0	-22.7	ALL	MSLP	SUR	1701	0	0	1.2	0.0	1.2
44768	64.2	-32.4	ALL	MSLP	SUR	1636	8	0	1.1	0.2	1.2
44769	60.4	-9.8	ALL	MSLP	SUR	1410	210	15	1.3	0.1	1.3
44770	27.3	-58.9	ALL	MSLP	SUR	535	1	0	0.9	0.4	1.0
44771	54.4	-19.9	ALL	MSLP	SUR	1609	4	0	1.2	-0.3	1.2
44772	56.6	-25.2	ALL	MSLP	SUR	1613	0	0	1.3	-0.4	1.4
44773	52.9	-11.6	ALL	MSLP	SUR	1056	2	0	1.2	0.1	1.2
44774	50.8	-14.9	ALL	MSLP	SUR	1481	3	0	1.1	-0.1	1.1
44775	53.5	-41.1	ALL	MSLP	SUR	721	5	1	1.9	-0.4	1.9
44777	58.5	-36.7	ALL	MSLP	SUR	945	1	0	1.5	0.0	1.5
44778	55.3	-33.9	ALL	MSLP	SUR	842	3	0	1.4	-0.3	1.4
44780	56.4	-43.6	ALL	MSLP	SUR	387	0	0	1.6	-0.5	1.7
44911	54.6	-47.0	ALL	MSLP	SUR	102	0	0	1.2	0.2	1.2
62501	49.3	-19.4	ALL	MSLP	SUR	353	0	0	1.0	-0.7	1.3
62503	41.2	-15.4	ALL	MSLP	SUR	510	0	0	0.8	-0.1	0.8
62504	40.8	-11.6	ALL	MSLP	SUR	525	0	0	0.8	-0.2	0.8
62505	48.8	-18.1	ALL	MSLP	SUR	331	0	0	1.1	-0.2	1.1
62506	49.6	-17.9	ALL	MSLP	SUR	115	0	0	1.0	0.0	1.0
62507	40.9	-22.5	ALL	MSLP	SUR	210	0	0	1.0	0.3	1.0
62508	49.7	-23.3	ALL	MSLP	SUR	598	0	0	1.1	0.0	1.1
62510	41.6	-17.7	ALL	MSLP	SUR	557	0	0	0.8	0.2	0.9
62513	45.0	-20.1	ALL	MSLP	SUR	351	0	0	0.9	0.4	1.0
62515	47.7	-19.4	ALL	MSLP	SUR	416	0	0	1.4	-0.1	1.4
62516	45.1	-18.2	ALL	MSLP	SUR	325	0	0	1.6	-0.6	1.8
62517	49.4	-19.5	ALL	MSLP	SUR	338	0	0	1.4	-0.3	1.4
62518	47.2	-20.0	ALL	MSLP	SUR	101	0	0	2.3	-0.3	2.4

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
62910	63.9	-35.5	ALL	MSLP	SUR	125	0	0	0.9	0.0	0.9
65594	60.2	-35.9	ALL	MSLP	SUR	1758	6	0	1.6	-0.3	1.7
65595	60.8	-30.0	ALL	MSLP	SUR	1548	1	0	1.2	-0.3	1.2
65598	63.7	-32.6	ALL	MSLP	SUR	1635	1	0	1.2	-0.3	1.3
65599	56.4	-54.0	ALL	MSLP	SUR	1180	0	0	2.0	-0.8	2.2
WIND SPEED											
20806	29.8	-64.0	ALL	SPEED	SUR	1	0	0	0.0	13.2	13.2
41504	31.8	-57.3	ALL	SPEED	SUR	1	0	0	0.0	12.5	12.5
41526	34.3	-60.3	ALL	SPEED	SUR	2	0	0	0.0	-2.9	2.9
41527	30.7	-77.5	ALL	SPEED	SUR	148	0	0	1.7	0.6	1.8
41529	30.8	-77.4	ALL	SPEED	SUR	150	0	0	1.9	0.2	1.9
41530	35.3	-73.4	ALL	SPEED	SUR	163	0	0	1.5	0.3	1.6
41611	12.7	-43.7	ALL	SPEED	SUR	271	0	0	1.3	1.2	1.8
41612	11.7	-44.2	ALL	SPEED	SUR	287	0	0	1.3	-0.1	1.3
41613	16.5	-45.0	ALL	SPEED	SUR	298	0	0	1.1	0.2	1.2
41614	13.7	-43.0	ALL	SPEED	SUR	268	0	0	1.2	-0.1	1.2
42531	30.6	-77.5	ALL	SPEED	SUR	108	0	0	4.5	2.0	4.9
42532	30.7	-77.5	ALL	SPEED	SUR	122	0	0	4.6	1.8	5.0
42533	33.1	-76.0	ALL	SPEED	SUR	120	0	0	3.1	0.8	3.2
44513	56.2	-54.3	ALL	SPEED	SUR	290	0	0	2.7	-5.7	6.3
44613	37.4	-13.8	ALL	SPEED	SUR	191	1	1	3.4	-2.9	4.5
44765	60.5	-16.0	ALL	SPEED	SUR	2	0	0	1.2	-8.5	8.6
62516	45.1	-18.2	ALL	SPEED	SUR	321	0	0	1.8	0.2	1.8
62517	49.4	-19.5	ALL	SPEED	SUR	274	0	0	2.0	-0.9	2.2
62518	47.2	-20.0	ALL	SPEED	SUR	299	0	0	2.2	0.5	2.2
WIND DIRECTION											
20806	29.8	-64.0	ALL	DIRN.	SUR	1	0	0	0.0	33.6	33.6
41504	31.8	-57.3	ALL	DIRN.	SUR	1	0	0	0.0	25.2	25.2
41526	34.3	-60.3	ALL	DIRN.	SUR	2	0	0	0.0	3.2	3.2
41527	30.7	-77.5	ALL	DIRN.	SUR	131	0	0	22.0	10.6	24.4
41529	30.8	-77.4	ALL	DIRN.	SUR	123	0	0	21.7	-2.4	21.8
41530	35.3	-73.4	ALL	DIRN.	SUR	128	0	0	19.9	0.4	20.0
41611	12.7	-43.7	ALL	DIRN.	SUR	232	0	0	30.3	-4.3	30.6
41612	11.7	-44.2	ALL	DIRN.	SUR	170	0	0	25.4	0.4	25.4
41613	16.5	-45.0	ALL	DIRN.	SUR	268	0	0	14.0	8.3	16.3
41614	13.7	-43.0	ALL	DIRN.	SUR	234	0	0	31.3	-4.8	31.7
42531	30.6	-77.5	ALL	DIRN.	SUR	104	0	0	17.3	-6.5	18.5
42532	30.7	-77.5	ALL	DIRN.	SUR	114	0	0	24.7	-7.9	25.9
42533	33.1	-76.0	ALL	DIRN.	SUR	120	0	0	15.5	-11.3	19.2
44513	56.2	-54.3	ALL	DIRN.	SUR	254	0	0	12.7	29.8	32.4
44613	37.4	-13.8	ALL	DIRN.	SUR	127	1	1	64.3	-48.0	80.2
44765	60.5	-16.0	ALL	DIRN.	SUR	2	0	0	9.7	-148.5	148.8
62516	45.1	-18.2	ALL	DIRN.	SUR	293	0	0	16.8	-13.9	21.8
62517	49.4	-19.5	ALL	DIRN.	SUR	250	0	0	30.2	-2.8	30.3
62518	47.2	-20.0	ALL	DIRN.	SUR	261	0	0	32.8	0.3	32.8

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3532	0	1	1.9	0.0	3538	0	3	0	8.8	0.9
AAN	139	0	3	1.7	-0.5	139	1	6	0	11.5	0.2
ACA	1354	1	1	2.1	0.5	1385	0	2	0	7.4	0.4
AEA	344	1	100	3.0	1.8	334	0	5	0	10.1	0.0
AEL	422	0	4	2.3	0.1	431	0	3	0	8.8	0.4
AFL	234	2	100	3.5	1.8	233	0	6	0	10.2	-0.2
AFR	882	1	5	1.9	0.0	895	0	6	0	8.7	1.2
AIC	34	0	6	2.7	-0.1	34	0	6	0	11.5	0.0
AIH	154	0	1	2.0	0.0	154	0	3	0	10.4	0.8
AMT	39	0	21	3.3	0.5	38	0	26	0	8.5	0.7
AMX	144	8	8	2.1	-0.4	151	0	7	0	9.0	0.7
ANZ	208	0	3	2.0	-0.9	205	0	5	0	7.8	-0.2
AOM	223	1	3	1.8	1.1	232	0	4	0	8.1	0.9
AUA	108	1	5	1.8	-0.6	110	0	6	0	8.0	0.7
AVA	118	1	4	1.9	-0.3	120	0	7	0	12.4	0.4
AZA	549	1	6	2.7	1.1	556	0	4	0	8.9	1.3
BAL	317	1	19	1.7	-0.4	338	0	22	0	10.5	0.8
BAW	1412	0	3	2.0	0.1	1435	0	4	0	9.0	1.1
BWA	128	0	3	2.7	1.6	130	0	5	0	9.7	1.4
CDN	873	0	1	2.1	0.8	870	0	2	0	7.9	0.8
CFC	38	0	11	2.2	-0.4	39	0	13	0	7.6	1.4
CFG	524	0	2	2.0	-0.8	530	0	3	0	9.2	0.4
CHG	32	0	3	2.3	0.7	34	0	6	0	9.0	3.0
CKT	71	0	6	1.6	0.6	72	1	10	0	9.0	-0.6
CLI	238	0	1	2.3	0.5	242	0	2	0	8.3	0.8
CLX	241	0	2	2.1	-0.3	241	0	2	0	9.1	0.3
CMM	340	0	2	2.1	0.3	341	0	1	0	7.0	0.9
COA	452	0	2	1.9	0.8	454	0	3	0	9.2	1.2
CRL	156	1	3	1.6	0.4	159	0	6	0	9.1	1.3
CSA	22	0	0	1.7	-0.8	22	0	0	0	7.9	0.7
CTM	24	8	25	2.0	0.0	24	0	21	0	8.2	0.1
CUB	172	1	100	2.5	1.5	176	0	11	0	10.2	1.4
DAF	27	0	0	2.5	0.0	27	0	0	0	7.0	1.0
DAL	2490	0	1	2.0	0.5	2487	0	3	0	9.3	0.6
DHL	308	6	100	5.2	-3.0	316	0	7	0	12.4	1.1
DLH	2495	1	7	1.9	0.3	2501	0	9	2	8.2	0.9
DOA	46	0	2	1.9	-0.3	45	0	4	0	10.3	1.2
ELY	95	1	6	1.8	0.0	100	0	13	0	10.6	1.1
EWW	140	0	100	4.0	0.9	142	0	100	0	14.8	4.5
FDX	625	0	1	1.8	0.7	630	0	3	0	8.8	0.7
FIN	400	0	2	1.8	0.6	398	1	5	0	8.5	0.9
GAF	169	1	1	2.1	0.3	170	0	0	0	7.8	1.1
GFA	28	0	0	1.6	0.0	28	0	0	0	5.5	-0.7
HLF	104	0	0	1.5	-0.7	105	0	2	0	9.9	0.0
IBE	1290	1	22	1.9	0.5	1302	0	24	0	10.5	1.0
ICE	679	1	2	1.9	0.2	676	0	2	0	8.0	1.1
JAL	30	3	3	1.8	0.5	30	0	0	0	7.6	-0.2
KLM	1736	0	1	1.9	0.4	1744	0	2	1	7.4	0.7
LDA	179	0	9	2.1	-0.8	181	0	10	0	9.4	0.4
LDI	88	0	32	2.3	-1.4	90	0	32	0	9.0	0.6
LIB	80	1	5	1.6	0.2	82	0	4	0	8.5	0.7
LKR	48	0	2	2.2	1.2	50	0	0	0	8.0	1.7
LOT	298	0	2	2.0	-0.7	296	0	5	0	8.9	0.7
LTU	515	0	4	1.8	0.4	512	0	5	0	9.1	0.8
MPH	522	0	1	2.2	0.0	524	0	2	0	8.3	0.9
NWA	2947	0	1	2.2	0.9	3008	0	3	0	9.1	0.7
OAL	29	0	7	3.6	3.0	29	0	7	0	10.8	2.5
PAC	56	0	7	1.7	-0.2	59	2	8	0	8.8	2.1
RCH	268	2	100	2.6	0.0	273	0	100	0	12.3	2.1

IDENT.	N.REP.	TEMPERATURE PG	PR	RMS	BIAS	N.REP.	WIND PG	PR	PC	RMS	BIAS
RIA	29	3	7	2.4	1.4	29	0	10	0	12.5	4.3
RJA	67	0	1	2.1	0.8	67	1	3	0	7.8	0.2
RRR	135	0	13	2.3	-0.1	136	0	17	0	10.1	0.7
SAB	26	0	4	2.1	0.9	27	0	4	0	7.8	0.4
SAS	1018	0	3	2.6	0.6	1012	0	2	0	8.7	0.2
SIA	77	0	4	1.8	-1.1	80	0	6	0	7.8	1.5
SLR	38	0	16	1.9	-0.7	44	0	23	0	10.1	2.3
SPP	86	2	24	1.4	-0.1	86	0	24	0	8.5	0.5
SVA	130	1	4	2.5	0.9	138	0	8	0	10.8	2.2
SWR	170	1	3	1.8	0.4	171	0	4	0	11.0	3.1
TAP	428	0	5	1.9	0.2	433	0	8	0	10.4	1.4
TEJ	80	0	11	1.4	0.4	80	0	14	0	9.5	1.7
TOW	80	1	6	2.1	0.3	81	0	4	0	7.4	1.5
TSC	203	1	6	2.8	0.9	206	0	5	0	10.3	1.6
TWA	1659	0	2	2.1	0.3	1658	0	3	0	8.9	1.4
UAL	1850	0	2	2.2	-0.9	1866	0	2	0	8.0	0.5
UKR	24	0	33	4.9	1.0	26	0	31	0	9.5	-1.2
ULE	141	0	1	1.5	0.4	137	0	3	0	9.5	0.5
UPS	546	3	19	1.8	-0.1	546	0	19	0	9.4	1.4
USA	254	0	2	1.6	-0.1	246	0	4	0	9.2	1.0
VIA	93	0	4	2.3	1.3	93	0	4	0	8.4	-0.2
VIR	224	0	1	2.0	0.1	227	0	4	0	9.0	1.7
WOA	109	0	5	1.8	0.7	112	1	7	0	8.4	1.1
BA	8555	0	11	1.3	0.4	8551	0	11	0	7.2	1.3
KL	3795	0	14	1.3	0.5	3795	0	14	0	6.9	1.3
LH	392	0	13	1.4	0.2	394	0	13	0	6.8	0.6
N	380	1	3	2.3	0.2	388	0	4	0	9.5	1.0

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	3	0	11.5	35.3	33.3
DBBH	12	Z	100	23	0	22.4	23.3	6.5
DBLK	12	Z	100	5	0	20.2	20.3	2.4
FNOR	00	Z	100	12	0	18.4	28.9	22.3
FNOR	12	Z	100	13	0	8.8	9.1	-2.5
FNOU	00	Z	100	10	0	21.6	32.2	23.9
FNOU	12	Z	100	10	0	11.2	13.9	8.2
FNPH	00	Z	100	13	0	12.5	12.7	2.2
FNPH	12	Z	100	10	0	18.6	25.0	-16.7
FNRS	00	Z	100	6	0	14.0	14.3	2.8
FNRS	12	Z	100	3	0	8.7	13.8	-10.7
JBOA	00	Z	100	1	0	0.0	14.0	14.0
LDWR	00	Z	100	29	0	11.8	13.6	6.8
LDWR	12	Z	100	27	0	13.2	16.5	-9.8
NPH	12	Z	100	1	0	0.0	55.0	-55.0
OXVH2	00	Z	100	10	0	17.1	17.2	-1.5
OXVH2	12	Z	100	10	0	14.3	15.8	-6.9
OXYH2	00	Z	100	21	0	16.0	16.7	4.6
OXYH2	12	Z	100	19	0	21.4	22.8	7.9
SHIP	00	Z	100	1	0	0.0	32.0	32.0
SHIPS	00	Z	100	7	0	19.6	26.0	17.1
SHIPS	12	Z	100	10	0	32.6	78.6	71.5
V2EZ	00	Z	100	9	0	14.6	20.6	14.6
V2EZ	12	Z	100	10	0	18.7	20.6	8.7
V2GH	00	Z	100	12	0	23.8	27.1	-13.0
V2GH	12	Z	100	11	0	24.3	31.9	-20.6
V2LV	00	Z	100	26	0	15.8	22.2	15.5
V2LV	12	Z	100	24	0	14.7	16.1	6.6
WTEU	00	Z	100	1	0	0.0	30.0	30.0
ZDLP	00	Z	100	1	0	0.0	117.0	117.0
ZDLP	12	Z	100	4	0	20.8	103.4	101.3
03953	00	Z	100	29	0	10.5	19.9	16.9
03953	12	Z	100	29	0	11.2	11.5	2.7
04018	00	Z	100	29	0	20.5	35.4	28.9
04018	12	Z	100	28	0	17.9	24.9	17.3
04220	00	Z	100	30	0	12.8	19.5	14.8
04220	12	Z	100	30	0	12.5	18.3	13.4
04270	00	Z	100	30	0	17.5	17.6	-1.9
04270	12	Z	100	29	0	13.3	15.2	-7.3
04339	00	Z	100	27	0	29.4	36.2	21.1
04339	12	Z	100	30	0	15.9	16.5	4.5
04360	00	Z	100	29	0	12.8	20.7	16.2
04360	12	Z	100	29	0	15.7	17.2	7.1
08001	00	Z	100	28	0	14.4	17.1	9.1
08001	12	Z	100	30	0	16.8	19.1	-9.2
08508	00	Z	100	29	0	14.4	14.6	2.3
08508	12	Z	100	29	0	12.9	15.7	-9.0
60020	00	Z	100	29	0	12.9	17.3	11.4
60020	12	Z	100	30	0	14.4	15.4	-5.6
71600	00	Z	100	30	0	16.0	18.6	9.5
71600	12	Z	100	27	0	15.0	16.9	7.7
72201	00	Z	100	25	0	27.4	46.1	37.1
72201	12	Z	100	23	0	22.9	54.3	49.3
72402	00	Z	100	28	0	16.4	28.0	22.6
72402	12	Z	100	27	0	15.6	37.5	34.1
74494	00	Z	100	18	0	13.1	13.4	2.6
74494	12	Z	100	27	0	33.2	48.0	34.6
78016	00	Z	100	3	0	18.8	26.8	-19.0
78016	12	Z	100	28	0	24.9	25.6	-6.0

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	4	0	6.7	16.4	15.0
DBBH	12	Z	500	23	0	15.5	15.8	3.0
DBLK	12	Z	500	6	0	12.5	15.3	8.8
FNOR	00	Z	500	12	0	15.3	19.1	11.4
FNOR	12	Z	500	13	0	11.5	11.6	1.5
FNOU	00	Z	500	13	0	5.9	9.7	7.6
FNOU	12	Z	500	11	0	6.9	8.1	4.3
FNPH	00	Z	500	13	0	7.5	7.5	-0.2
FNPH	12	Z	500	11	0	9.2	10.1	-4.2
FNRS	00	Z	500	6	0	15.5	15.5	0.8
FNRS	12	Z	500	5	0	10.4	10.4	1.2
JBOA	00	Z	500	1	0	0.0	0.0	0.0
LDWR	00	Z	500	29	0	10.4	12.6	7.1
LDWR	12	Z	500	27	0	9.5	9.6	-1.3
NPH	12	Z	500	1	0	0.0	3.0	-3.0
OXVH2	00	Z	500	10	0	7.1	7.2	-1.4
OXVH2	12	Z	500	10	0	10.5	13.9	-9.0
OXYH2	00	Z	500	21	0	17.2	18.0	-5.5
OXYH2	12	Z	500	21	0	14.4	14.9	-3.8
SHIP	00	Z	500	1	0	0.0	15.0	15.0
SHIPS	00	Z	500	11	0	13.0	19.9	15.1
SHIPS	12	Z	500	12	0	18.5	24.3	15.7
V2/V	00	Z	500	1	0	0.0	8.0	-8.0
V2EZ	00	Z	500	9	0	12.4	20.1	15.8
V2EZ	12	Z	500	11	0	13.7	14.4	4.5
V2GH	00	Z	500	14	0	13.4	13.5	-2.1
V2GH	12	Z	500	15	0	16.2	16.8	-4.5
V2LV	00	Z	500	28	0	11.6	13.5	6.9
V2LV	12	Z	500	26	0	5.9	7.9	5.2
WTEU	00	Z	500	1	0	0.0	22.0	22.0
ZDLP	00	Z	500	1	0	0.0	74.0	74.0
ZDLP	12	Z	500	6	0	12.4	80.6	79.7
03953	00	Z	500	29	0	8.2	18.4	16.5
03953	12	Z	500	30	0	9.8	12.9	8.3
04018	00	Z	500	30	0	15.4	24.9	19.5
04018	12	Z	500	29	0	11.8	15.1	9.3
04220	00	Z	500	30	0	17.6	17.7	-1.6
04220	12	Z	500	30	0	13.0	13.0	0.7
04270	00	Z	500	30	0	16.4	16.9	-4.1
04270	12	Z	500	30	0	17.6	18.5	-5.8
04339	00	Z	500	29	0	15.2	17.3	8.2
04339	12	Z	500	30	0	15.1	15.3	-2.2
04360	00	Z	500	29	0	13.7	14.6	5.1
04360	12	Z	500	30	0	12.6	12.9	-2.8
08001	00	Z	500	30	0	11.5	16.3	11.5
08001	12	Z	500	30	0	14.3	14.7	-3.4
08508	00	Z	500	29	0	9.9	14.5	10.6
08508	12	Z	500	28	0	11.3	11.7	3.0
60020	00	Z	500	29	0	8.7	16.2	13.7
60020	12	Z	500	30	0	12.5	14.2	6.8
71600	00	Z	500	30	0	17.3	18.0	5.0
71600	12	Z	500	27	0	15.2	16.6	6.8
72201	00	Z	500	29	0	9.4	16.3	13.2
72201	12	Z	500	27	0	6.6	14.3	12.7
72402	00	Z	500	29	0	8.8	16.1	13.5
72402	12	Z	500	28	0	9.5	15.4	12.2
74494	00	Z	500	29	0	9.8	10.3	3.1
74494	12	Z	500	29	0	12.3	12.4	1.0
78016	00	Z	500	3	0	4.5	8.3	-7.0
78016	12	Z	500	27	0	17.8	19.0	-6.8

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	3	0	0	0.0	2.7	1.4
DBBH	12	V	100	22	0	0	0.0	-0.5	-0.1
DBLK	12	V	100	5	0	0	2.6	-0.6	-0.3
FNOR	00	V	100	12	0	0	1.6	-0.1	-0.5
FNOR	12	V	100	13	0	7	5.5	-1.6	0.6
FNOU	00	V	100	9	0	0	4.2	0.7	1.6
FNOU	12	V	100	9	0	0	4.2	-0.8	-1.1
FNPH	00	V	100	12	0	0	4.2	-0.7	-0.3
FNPH	12	V	100	9	0	0	3.6	-2.5	0.3
FNRS	00	V	100	6	0	0	3.6	0.6	1.4
FNRS	12	V	100	3	0	0	3.6	0.7	2.5
JBOA	00	V	100	1	0	0	3.6	1.6	0.3
LDWR	00	V	100	29	0	0	3.6	-0.1	-0.8
LDWR	12	V	100	27	0	0	1.4	-0.4	-0.7
NPH	12	V	100	1	0	0	1.6	-0.6	-2.2
OXVH2	00	V	100	10	0	0	1.6	1.7	0.9
OXVH2	12	V	100	10	0	0	3.9	0.0	0.3
OXYH2	00	V	100	20	0	0	1.9	-0.5	1.5
OXYH2	12	V	100	17	0	0	1.5	-0.8	1.1
SHIP	00	V	100	1	0	0	2.1	-11.3	-2.6
SHIPS	00	V	100	5	0	20	2.1	-5.7	3.6
SHIPS	12	V	100	5	0	20	2.1	-3.2	3.1
V2/V	00	V	100	1	0	0	2.1	2.8	1.1
V2EZ	00	V	100	9	0	0	2.1	1.2	1.0
V2EZ	12	V	100	10	0	0	2.1	-0.5	-0.2
V2GH	00	V	100	11	0	0	1.6	2.4	0.9
V2GH	12	V	100	11	0	0	3.8	-1.8	1.3
V2LV	00	V	100	26	0	0	4.1	0.9	1.2
V2LV	12	V	100	23	0	0	3.0	1.1	-0.5
WTEU	00	V	100	1	0	0	2.9	-5.0	0.5
03953	00	V	100	28	0	0	2.0	-0.2	0.2
03953	12	V	100	29	0	0	2.1	-0.3	0.7
04018	00	V	100	29	0	0	1.4	0.7	-0.3
04018	12	V	100	26	0	0	2.9	-0.5	-0.9
04220	00	V	100	30	0	0	2.3	0.3	1.4
04220	12	V	100	30	0	0	1.6	0.3	1.5
04270	00	V	100	30	0	0	2.1	0.5	1.7
04270	12	V	100	29	0	0	2.2	-0.7	1.0
04339	00	V	100	27	0	0	3.5	0.9	-0.3
04339	12	V	100	30	0	0	2.3	0.8	-0.8
04360	00	V	100	29	0	0	2.8	0.3	1.0
04360	12	V	100	29	0	0	2.0	0.3	-0.1
08001	00	V	100	28	0	0	2.3	1.2	0.3
08001	12	V	100	30	0	0	2.5	-0.8	0.0
08508	00	V	100	29	0	0	2.8	1.3	-0.2
08508	12	V	100	30	0	0	2.6	-1.0	-0.5
60020	00	V	100	28	0	0	4.0	0.2	0.8
60020	12	V	100	30	0	0	3.2	-0.6	-1.0
71600	00	V	100	30	0	0	3.8	0.4	-0.5
71600	12	V	100	27	0	0	2.8	0.2	0.0
72201	00	V	100	25	0	0	2.2	0.9	-0.4
72201	12	V	100	23	0	0	2.4	1.4	-0.3
72402	00	V	100	25	0	0	2.6	-1.1	0.8
72402	12	V	100	26	0	0	3.5	-3.0	-1.7
74494	00	V	100	18	0	5	3.2	-0.3	-1.3
74494	12	V	100	24	0	0	5.9	-1.2	0.7
78016	00	V	100	3	0	0	3.4	-2.5	-1.0
78016	12	V	100	26	1	3	3.4	-1.0	-0.5

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September, 1996

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	4	0	0	0.0	2.2	-0.6
DBBH	12	V	500	22	0	0	0.0	0.2	0.1
DBLK	00	V	500	1	0	100	3.1	10.9	-2.3
DBLK	12	V	500	6	0	0	3.1	-0.3	-0.2
FNOR	00	V	500	12	0	0	2.3	0.2	-2.7
FNOR	12	V	500	13	0	7	4.1	-1.7	-0.9
FNOU	00	V	500	13	0	0	3.3	-2.4	-0.9
FNOU	12	V	500	11	0	0	2.9	-1.4	1.5
FNPH	00	V	500	12	0	0	3.3	-1.0	-1.8
FNPH	12	V	500	11	0	0	4.4	-0.8	-0.6
FNRS	00	V	500	6	0	0	2.2	-0.6	0.0
FNRS	12	V	500	5	0	0	2.2	-1.5	-3.0
JBOA	00	V	500	1	0	0	2.2	0.1	1.2
LDWR	00	V	500	29	0	0	2.2	0.8	0.3
LDWR	12	V	500	27	0	0	2.5	-0.2	0.3
NPH	12	V	500	1	0	0	2.7	-3.1	2.8
OXVH2	00	V	500	10	0	0	2.7	0.6	0.2
OXVH2	12	V	500	10	0	0	2.3	-1.1	0.7
OXYH2	00	V	500	21	0	0	4.1	1.8	0.0
OXYH2	12	V	500	21	0	0	5.2	0.5	1.4
SHIP	00	V	500	1	0	0	3.9	-8.0	1.3
SHIPS	00	V	500	9	0	22	3.9	-2.2	1.0
SHIPS	12	V	500	10	0	20	3.9	-1.8	4.1
V2/V	00	V	500	1	0	0	8.6	3.4	0.2
V2EZ	00	V	500	9	0	0	8.6	0.1	0.1
V2EZ	12	V	500	11	0	0	8.6	1.0	1.2
V2GH	00	V	500	13	0	0	3.7	1.2	0.1
V2GH	12	V	500	15	0	0	1.5	-1.4	-0.4
V2LV	00	V	500	27	0	0	2.8	-0.8	0.9
V2LV	12	V	500	26	0	0	1.8	-2.2	1.4
WTEU	00	V	500	1	0	0	2.9	4.0	-2.5
03953	00	V	500	29	0	0	2.9	0.3	-0.5
03953	12	V	500	30	0	0	2.9	-0.1	0.3
04018	00	V	500	29	0	0	2.8	1.2	-0.6
04018	12	V	500	29	0	0	4.1	1.2	0.0
04220	00	V	500	30	0	0	3.7	-0.8	0.3
04220	12	V	500	30	0	3	3.9	-1.1	1.6
04270	00	V	500	30	0	0	4.9	0.4	2.9
04270	12	V	500	30	0	0	5.0	-0.4	0.5
04339	00	V	500	26	0	0	3.3	1.9	0.7
04339	12	V	500	30	0	0	3.3	0.4	-0.3
04360	00	V	500	29	0	0	2.9	0.6	0.6
04360	12	V	500	29	0	0	3.6	-0.2	-0.4
08001	00	V	500	29	0	0	5.6	0.1	-0.6
08001	12	V	500	29	0	0	3.3	-0.6	-0.8
08508	00	V	500	29	0	0	3.5	0.6	-0.7
08508	12	V	500	28	0	0	3.2	-0.8	-0.6
60020	00	V	500	28	0	0	5.6	0.9	-1.0
60020	12	V	500	30	0	0	3.2	-1.8	-1.0
71600	00	V	500	30	0	0	3.8	-0.6	-0.2
71600	12	V	500	27	0	0	3.8	0.3	1.0
72201	00	V	500	29	0	0	3.0	0.4	0.1
72201	12	V	500	27	0	0	2.7	0.5	0.0
72402	00	V	500	26	0	0	2.5	-0.3	-0.3
72402	12	V	500	28	0	0	3.2	-2.8	0.1
74494	00	V	500	29	0	0	4.7	-0.3	0.8
74494	12	V	500	29	0	0	3.4	-0.5	0.4
78016	00	V	500	3	0	0	4.3	-2.0	1.9
78016	12	V	500	27	0	0	4.3	-2.2	0.7

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45